Electric Railway Practices

1924

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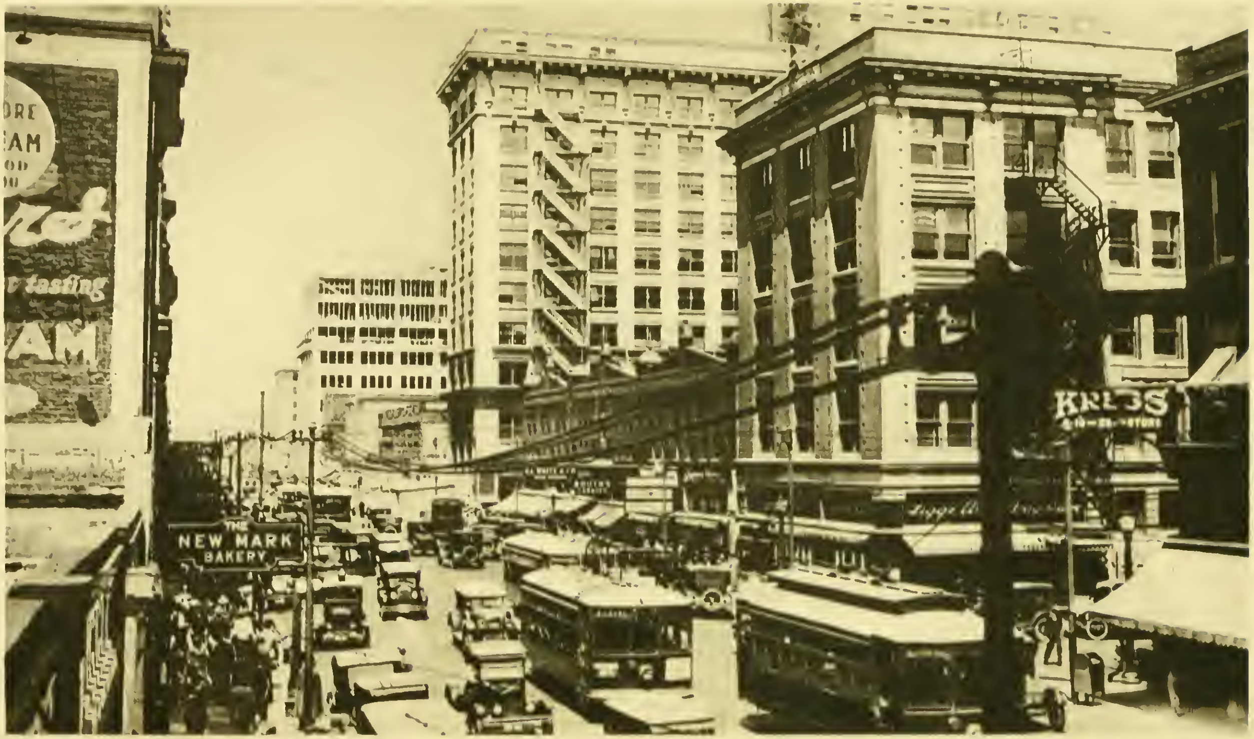

Traffic Scene in Fort Worth, Texas

Stone & Webst

Electric Railway Practices
in 1924

Summary of most significant
features of presentations made
by electric railways,
August 15, 1924, to the
Charles A. Coffin Foundation

Edited by
HENRY H. NORRIS
for the Foundation

American Electric Railway Association
New York, N. Y.
1925

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FOREWORD

AT the annual convention of the American Electric Railway Association held in Atlantic City, Oct. 6 to 10, 1924, the second annual award of the Charles A. Coffin medal was made, on the recommendation of a committee of the Association, comprising Britton I. Budd, chairman, J. N. Shannahan and James H. McGraw. The recipient was the Northern Texas Traction Company, one of nine companies which made presentations of their work to the committee, and one which had made a presentation the preceding year. The headquarters of this company are in Fort Worth, and it operates both city and interurban lines.

A cash prize of $1,000 for the employees' mutual aid association of the company was awarded with the medal. This prize is one of a number of awards made annually by the Charles A. Coffin Foundation, established in December, 1922, by the board of directors of the General Electric Company. The purpose of the Charles A. Coffin Foundation is to give (a) prizes to employees, recognition to (b) lighting and power, and (c) railway companies for improvement in service to the public, and (d) fellowships to graduate students and funds for research work at technical schools and colleges. The electric railway award is made to the company which during a given year has made a distinguished contribution to the development of electric railway transportation.

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The factors which the committee considered were as follows:*

1. The particular initiative, skill and enterprise manifested in popularizing electric railway service — more riders and more revenue.

2. Outstanding success in gaining public good will.

3. Economies which have been introduced in operation resulting from original ideas.

4. Economies in operation viewed as a measure of the extent to which the company has taken advantage of new developments in operating and maintenance practice and equipment originating with others.

5. Improvements in construction practice which have resulted in reduced first cost, reduced maintenance or a greater reliability of service.

6. Particular success in conducting a safety program and actually reducing the number and seriousness of accidents.

7. Outstanding accomplishment in development of good relations between management and employees.

8. Special accomplishment in financing which reduces the cost of new capital, such as the distribution of securities among customers and employees, rearrangement of the financial structure, etc.

The companies which made presentations in 1924 were the following: Aurora, Elgin & Fox River Electric Company, Aurora, Ill.; Charleston Consolidated Railway & Lighting Company, Charleston, S. C.; Interstate Public Service Company, Indianapolis, Ind.; Memphis Street Railway, Memphis, Tenn.; Northern Texas Traction

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* The factors have been somewhat modified for the 1925 award, as explained in a letter sent out by the committee early in 1925. The date for making presentations has also been advanced from Aug. 15 to Aug. 1.

Company, Fort Worth, Tex.; San Francisco-Sacramento Railroad, Oakland, Calif.; Shreveport Railways, Shreveport, La.; Union Street Railway, New Bedford, Mass., and United Railways & Electric Company, Baltimore, Md.

Following the precedent established last year, the Charles A. Coffin Foundation decided to have a digest of the 1924 presentations made in order that there might be available a clear picture of the phases of electric railway practice which progressive managements consider most creditable. This digest aims to cover the most suggestive parts of the presentations even if the devices or practices described are not entirely new. Obviously the best elements of practice tend to become standard; the fact that they do so is evidence of their value. A study of the digest will indicate to an executive the extent to which his own practice conforms to present tendencies. It should suggest one or more lines of improvement which he might profitably apply.

The treatment is purposely condensed in order that the busy executive may be able to review it quickly, picking out for the attention ot department heads those items which appear to have local application.

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ELECTRIC RAILWAY PRACTICES IN 1924

CHAPTER I

Tendencies in Rolling-Stock Practice

THE year 1924 was an active one in the rolling-stock department of electric railways, as evidenced by the purchase of new and advanced types of cars, and by the widespread remodeling of existing equipment. An example of this is furnished by the Interstate Public Service Company, which between Aug. 1, 1923, and Aug. 1, 1924, spent nearly $600,000 for new cars and buses. This money purchased sleeping cars, parlor-buffet dining cars, a fleet of buses, express motor and trail cars, a locomotive, gondolas, and box and baggage cars. These purchases, totaling a large sum for a company already reasonably well equipped, is characteristic of the present-day progressive spirit of the electric railway. The expenditure was called for by the steady increase in freight and passenger business, due to methods and practices which will be recited at appropriate points in this summary. Attention will be focussed here on some of the more interesting features of the equipment purchased.

The sleeping cars put into service between Indianapolis and Louisville during the past year by this company contain some features not found in Pullman sleepers.

For example, the upper berths, as well as the "lowers," have windows, which are equipped with folding screens in summer and storm sash with ventilating slides in winter.

The ladies' drawing room has two dressing tables with folding mirrors, chairs and grip shelves to match, washstand, dental lavatory, racks and other necessary equipment. In the men's dressing room, besides the usual washstands and dental bowl, there is a couch, and the room can be used as a smoking compartment. In both dressing rooms are hot and cold water, electric fans, drinking fountain and toilets.

Berths Are of Extra Length

The main compartment, when made up as a day coach, seats forty. The capacity as a sleeper is twenty, the ten "lowers" and ten "uppers" being of 3 inches greater length than in standard Pullmans. The interior is attractively finished in light mahogany, with white ceilings. The floor of the main compartment and ladies' room is covered with Wilton carpet, battleship linoleum being used in the tunnel way, vestibule and men's dressing room.

A 32-volt storage battery furnishes lighting current, supplemented by the trolley circuit as auxiliary. Dome fixtures are employed in the general lighting, while the usual berth fixtures provide individual lights for the seats. The sleepers are not motor cars.

The buffet parlor cars, which are in daily service between Indianapolis and Louisville, are equipped with twenty-two large, movable chairs and a divan, thus accommodating twenty-five persons. These chairs are upholstered in dark brown Russian leather with linen slip covers for summer use.

Each car is supplied with three 2-passenger and three 4-passenger hook-in tables, and each has a kitchen, with coal stove, refrigerator and lockers. Tables may be set up in any part of the car.

The buffet cars have enclosed observation rear ends, the loading vestibule being on the front end. The control apparatus is enclosed when a car is being used as a trailer. Like the sleeping cars the interior finish is light mahogany and the floors are covered with Wilton carpet. The main lighting is from the trolley, but an emergency lighting circuit of 15-watt lamps is automatically connected to a storage battery when the power fails. There are two 150-horsepower motors on these cars, with PC multiple-unit control. All of the passenger trail cars and new express cars are so equipped that they may be operated in trains of from three to five cars per train.

Car Development Illustrated in Baltimore

In its 1924 presentation the United Railways & Electric Company gave a graphic picture of its recent development work on rolling-stock. This reflects the evolution which is going on among the more progressive roads throughout the industry. For example, the company has now practically completed its program of conversion to the prepayment system. For some years it has been the policy to purchase only cars suitable for this purpose and to convert existing equipment for prepayment fare collection.

Experiments are being made also with the Peter Witt type of car with a view to putting a considerable number into use. To distinguish these from the present prepayment cars, which are painted red, and to ascertain the sentiment of the public as to the color itself, the new cars are painted cadmium yellow. The following points cover the departures which have been made from the usual type of Peter Witt car:

1. The two sample cars now in operation are equipped with an emergency controller and air-brake valve at the rear end, these being concealed under the " bay window seat," the center section of which can be removed when it is necessary to operate the car from the rear end.

2. An emergency door is provided on the left side of the front platform, which can be operated manually from a conductor's emergency station, just inside the front platform. Thus, in case it should become necessary, say on account of a blockade, to turn the car at a crossover, the conductor will leave his normal station at the center of the car and work at this emergency station in connection with the emergency door. He will thus continue to receive and discharge passengers on the proper side of the car.

3. These cars are equipped with multiple-unit control and can be operated either singly or in trains. The second car of a train becomes an ordinary center-entrance, center-exit, pay-pass trailer.

4. All electric and air connections are made automatically when the cars are coupled, including bus and control lines.

After investigating the practice elsewhere, the United Railways & Electric Company has constructed a permanently coupled, two-car, three-truck unit. Two comparatively modern semi-convertible cars, formerly seating forty-seven passengers each, were used for the purpose, and the whole unit now seats eighty-seven. The new equipment consists of two new motors, new multiple-unit control, and a special center truck substituted for two of the older trucks.*

Still another development is the construction of an experimental, permanently coupled two-car train. For this purpose two of the older double-truck closed cars were equipped with modern, in place of the old maximum-traction trucks, with air brakes, and with multiple-unit control.

As a result of the program for equipping two-car, three-truck trains, experiments are being conducted in converting 20-bench open cars into four-motor, double-truck closed cars of the prepayment type. Originally the open cars consisted of the bodies only, and all equipment, as well as the trucks, had to be transferred from the closed cars each year. With the trucks, motors and other equipment salvaged in building the three-truck unit, all of the material needed for remodeling the open cars was obtained, including vestibules.

In all of its car development the company uses models like those shown in Plate XVIII so that details can be worked out with all the practical factors in view.

One-Man Cars Increasingly Popular

The officials of this company have been making an intensive study of improved seating arrangements, particularly with a view to converting some cars for 1-man operation. Folding seats of a type originating in Brooklyn have been adopted for use in the vestibuled cars to be used in front of doors when these are not in use. Folding seats have been installed in some instances at the ends of longitudinal seats, to be made use of when space is not needed for knee room on cross seats.

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* This is the principle followed in the Milwaukee unit described in "Electric Railway Practice in 1923."

The note regarding development work in Baltimore suggests that a significant tendency is toward the greater use of operation by one man. During the past year the percentage of cars operated by one man on the property of the Charleston Consolidated Railway & Lighting Company was increased from fifty-one to ninety-one. Experience with the Birney cars on a small scale had convinced the company of their good features, but it was the necessity for doing something to offset the decrease in revenues following the post-war slump in local activities that compelled the more general use of 1-man cars. Twenty single-truck and six double-truck cars were fitted with safety devices and made over for 1-man operation.

Similarly the Interstate Public Service Company has either converted all cars into the 1-man type or purchased cars of this type for the city properties at Columbus, Jeffersonville and New Albany, excepting those operating between New Albany, Jeffersonville and Louisville.

From the Northern Texas Traction Company comes added testimony as to the value of separate entrance and exit doors for single-truck, 1-man cars, a selective control being used to permit separate operation of these doors. This company during the past year rebuilt several double-truck city cars for 1-man operation. These were equipped with a rear loading door for future possible use with street collectors. This door can be opened and closed from the street, but it is so interlocked with the air-brake mechanism that the operator cannot start the car while the rear door is open.

An Illustration of Weight Reduction

As an indication of the improvements which have been made in car design during five years, it is of interest to note that double-truck cars purchased by the Union Street Railway in 1918 weighed 21 tons, while those purchased in 1923 weighed but 15 tons. The cars are of the same length and have the same seating capacity. Accompanying the reduction in weight was one of 60 horsepower in motor capacity, or from 160 to 100 horsepower. The height is less by 1 foot 8 inches, or 10 feet 11 inches as compared with 12 feet 7 inches. Wheels are 6 inches smaller, *i. e.*, 27 inches as compared with 33 inches. This company is changing its rolling-stock to the prepayment type and is doing this work in its own shop at the rate of about one car a month. The work is done by the regular shop force in addition to its regular work.

Trailers with Control Equipment

The San Francisco-Sacramento Railroad has found it economical to arrange its two-car trains as motor-trailer rather than two-motor-car trains. Control and air equipment has been installed on the trailers so that it is not necessary, in passenger service, to do any switching at the end of the line. Changing from the head of the motor car to the head of the trailer, the motorman finds the same type of operating mechanism. The "trailer" thus becomes the head of the train. This arrangement is especially flexible when it is necessary to add cars to trains that have parlor cars attached at the rear, as either a motor car or a trailer can be put on at the head end of the train.

In addition to such fundamental car improvements as those mentioned, there were many devices mentioned in the 1924 presentations which are of more than passing interest.

Some Betterments in Car Details

For example, cars on the interurban division of the Northern Texas Traction Company have been equipped with extra trolley bases, with poles and wheels, all ready for use. Details of this are given in a later chapter. The sliding shoe is used for current collection from the catenary overhead line. Formerly each car was provided with an extra pole and shoe for emergency use, but it required some minutes for the conductor to put this in place in case the regular pole was injured. Now it is necessary only to fasten down the injured pole and unhook the new one. A wheel is furnished with the second pole instead of a shoe for use in backing into sidings.

An automatic speed regulator has been developed by the San Francisco-Sacramento Railroad for increasing the speed of its freight motor cars on the western, or mountain division, when they are operating on level track. These motors are geared for a speed of 17 miles per hour on the grades, resulting in a speed unnecessarily low on the level. A device for weakening the motor field strength when the draft of current falls below a predetermined value increases the speed on the level to 26 miles per hour.

This is accomplished by weakening the fields of the

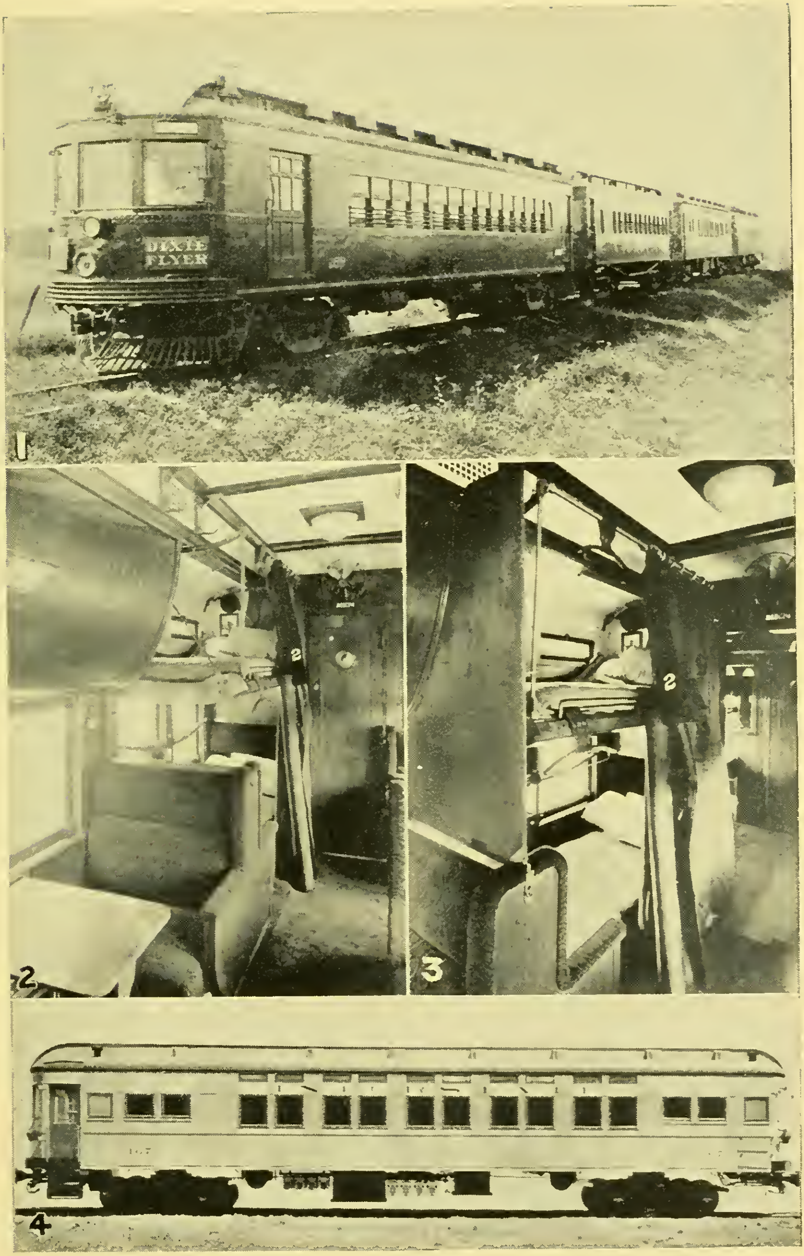


Plate I — (1) *The famous "Interstate Dixie Flier."* (2), (3) *Berths on the "Interstate sleepers" are commodious and comfortable.* (4) *Exterior view of the "Interstate sleeper."*

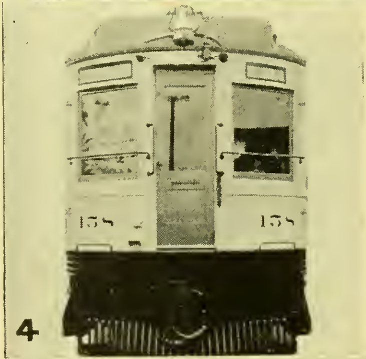


PLATE II — (1) *An all-steel parlor-buffet car on the "Interstate."* (2) *Parlor-buffet car between meal-times.* (3) *Same car with luncheon tables set up.* (4) *End view of same car.* (5) *"Interstate" all-steel express train.*

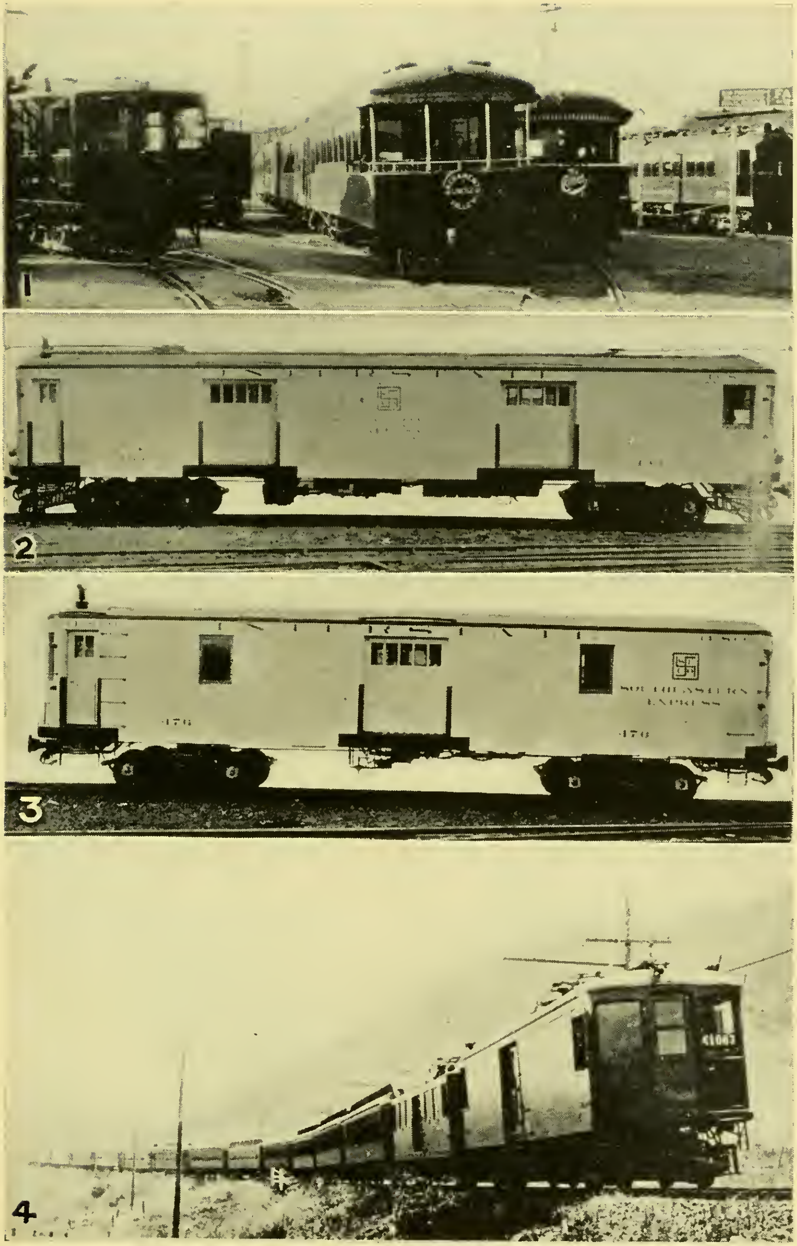


Plate III — (1) *Typical "San Francisco-Sacramento" equipment.* (2), (3) *"Interstate" all-steel express motor and trailer cars.* (4) *A 15-car "San Francisco-Sacramento" passenger train.*

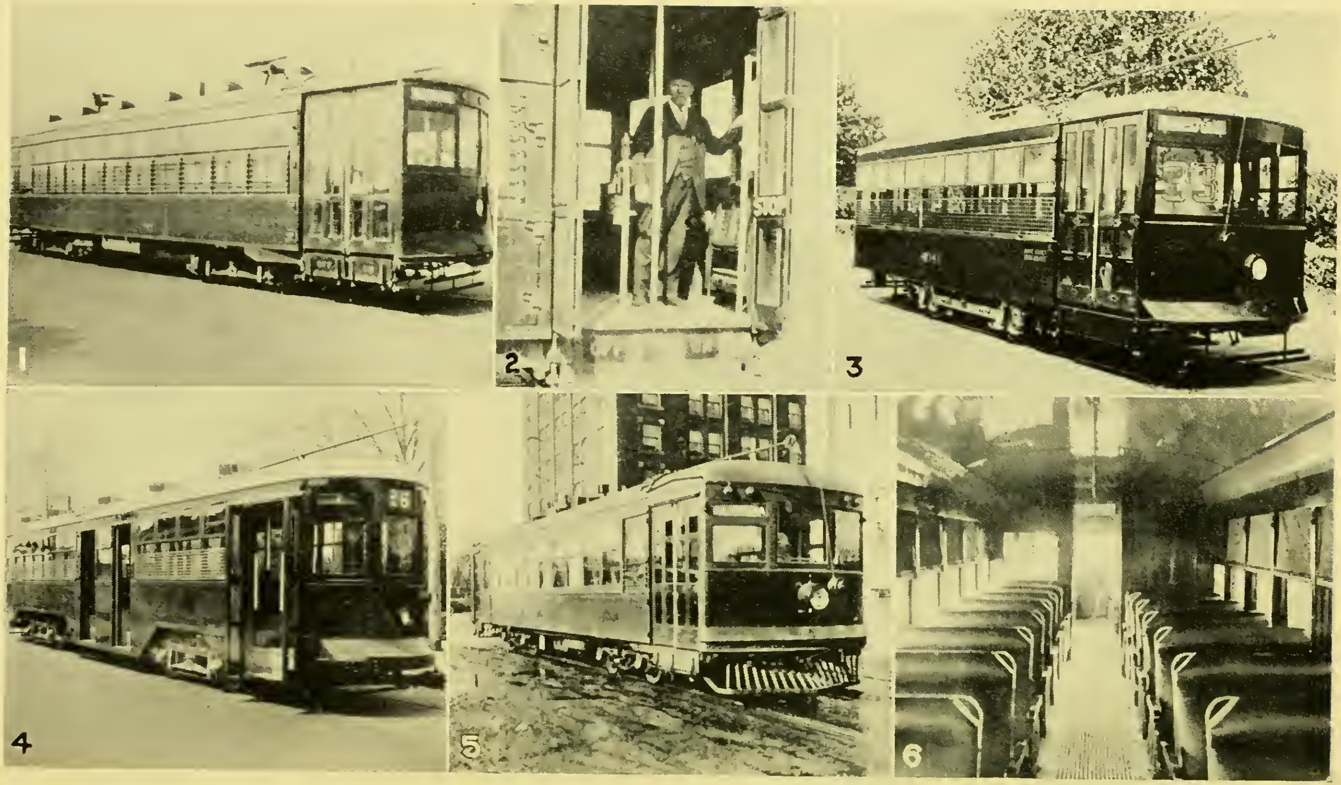


PLATE IV — *Typical modern cars.* (1) *Light-weight car, Fort Worth.* (2) *Door details, same.* (3) *1-man car, Baltimore.* (4) *Peter Witt car, same.* (5) *Interurban car, Aurora, Elgin & Fox River Electric Company.* (6) *Interior, same.*

locomotives with external parallel resistance controlled by electro-pneumatic switches. These switches are in turn controlled by circuits so connected that the controller has to be in the full running position and the current below a predetermined value before the switches close, placing the resistance in parallel with the fields of two motors and energizing an electro-pneumatic valve. The valve allows air to flow to a timing reservoir, and after six seconds switches close on the other two motors. This provides a time element equivalent to moving the controller two notches. This device continues in operation until the controller is moved to the off position or the current rises above a predetermined value, when the motor connections return to normal.

As this device is outside the control of the motorman there is no danger that he will weaken the fields when they should not be weakened. The use of this plan has increased the average efficiency of the motors and has cut down the time of a freight crew 1½ hours per day.

This railroad also cut down the power consumption of parlor cars by the use of ball bearings, after a year's experimenting with these bearings. Another result was an increase in speed of the trains containing these cars, which are trailers.

The San Francisco-Sacramento operates over the " Key System " for three miles into Oakland, necessitating here the use of roller pantographs instead of the 10-inch wheels which are its standard. Formerly the cars were in darkness when the changeover was made, but recently battery lights have been installed to eliminate this condition. Freight trains have also been equipped with electric lanterns, replacing oil lanterns, in the interest of reliability and safety.

The installation of a double catenary overhead system by this railroad has permitted the use of pantograph current collectors, with sliding shoes, on the locomotives. This releases one man who was formerly required to change trolleys for shifting operations. At the same time it facilitates switching. The contact between the collector and the contact wire is improved, also, as compared with the trolley wheels formerly used. Other car improvements devised and installed by the San Francisco-Sacramento Railroad, primarily to insure safety are described in the chapter on that subject.

The Interstate Public Service Company has placed on its cars several devices which facilitate operation. All passenger and express cars have signals which indicate to the motorman of a train when the trolley on any car leaves the wire. The equipment also provides facilities so that when the conductor is backing a train he can sound signals to warn the traffic on the street. He can signal direct to the motorman, and can if necessary make an emergency application of the brakes.

CHAPTER II

Improving Service Quality and Quantity

THE two characteristics of electric railway service which may be covered by the terms " quality " and " quantity " deserve continuous study by the management.

A study of the 1924 presentations with these characteristics in mind suggests such questions as these: (1) How are cars kept on schedule? (2) How can schedule speeds be increased? (3) What new conveniences can be provided for the benefit of passengers and shippers, as to (a) expediting car loading and passenger interchange, (b) routing, (c) co-ordinating services, (d) placing suitable signs on cars and elsewhere to facilitate use of the services, (e) supplying timetables and similar conveniences, etc.? (4) What new or enlarged opportunities are there for transportation and auxiliary service? Some answers to these queries have been gleaned from the " briefs."

First, there is unanimous agreement that cars must be kept on time. This is increasingly difficult on account of traffic congestion over which the railways have little control. Few railways in cities of moderate size have greater obstacles of this kind than the Charleston Consolidated Railway & Lighting Company, Charleston, S. C. Charleston's principal business street is narrow, and automobile parking here, as well as elsewhere, has held back the cars. There are also several railroad grade crossings over its lines, and other inconveniences.

In spite of these difficulties, 1924 showed a marked improvement over 1923 as to schedule maintenance, due to close scrutiny of the facts and a comprehensive program of improvements. Early in 1923 less than 77 per cent of the cars were on time, *i. e.*, not more than 3 minutes late, or 1 minute early. In the same period of 1924 the average was nearly 89 per cent, and in May it was over 95 per cent.

In studying these figures the following facts should be noted:

1. All traffic checks used in the comparison were made in the rush hours.

2. In 1923, 1-man cars constituted 51.3 per cent of the total; a year later, 91.3 per cent.

3. In 1923, schedule and traffic checks were made monthly, covering 18 hours of service; since January, 1924, two or three checks have been made weekly, during rush hours.

4. The schedule speed in 1924 was more than 10 per cent higher than in 1923.

5. In 1923, line inspectors spent most of their time "riding lines" and instructing trainmen. Now certain inspectors make it an important part of their duty, particularly during rush hours, to help maintain car schedules.

Of vital interest in this connection is the way in which the company, within a few months, increased the schedule speed of its cars from 7.55 to 8.4 miles per hour, with a corresponding decrease in headway.

One factor, of course, was the careful checking, already mentioned. Another factor in the improvement was the elimination of unnecessary stops. Previously there were stops at insignificant alleys and in the middle of blocks. Most of these were eliminated, but even yet there are too many as compared with the standard of eight stops to the mile. Also, by co-operation with the steam railroads, the delays at grade crossings have been reduced to a minimum. The railroads were found to be willing to keep trains off the crossings as much as possible when the effect of blocking the street-car tracks was made clear.

Co-operation with the traffic department of the city was still another element in increasing schedule speed. Fortunately a change in the city administration brought into the position of Chief of Police a man of the " doer " type. Violations of the parking and other ordinances affecting street delays resulted in arrests and fines, and blocking of the street cars was greatly reduced. While good fortune favored the railway in this matter, it was prompt to avail itself of the help thus made available. The Police Department also allowed far-side stops to be made at some congested points with a view to speeding up the car service.

At one time in Charleston it was not an uncommon thing to see trainmen moving automobiles off the track so that their cars could pass. Cars have been known to be held up 30 minutes due to improper parking. Now, unless an automobile driver is anxious to contribute to the city treasury he is careful to note that his machine clears the car line when he parks it.

Another railway management that believes in careful inspection as an essential in good operation is that of the Aurora, Elgin & Fox River Electric Company. This company has a system of daily inspection and checking of all features of its service, including conduct of operators toward patrons, tidiness of operators, cleanliness of cars, proper display of signs and conditions affecting safety. Each inspector rides with each operator at least once a day.

Conveniences for Passengers and Shippers

An important element in good service is proper provision for boarding, and alighting from cars. In Baltimore good results have been secured from the establishment of two-car stops at congested points. Also at many important interchange points away from the center of the city, where a large percentage of paper transfers are used, front-end boarding has been made permissible for transfer passengers. (Rear end boarding is in general use in this city.) The motormen collect the transfers, afterwards turning them over to the conductors. This speeds up loading and distributes the load more equally through the car. To prevent abuse of the transfer privilege, front-end loading is not practised at congested points in the downtown district.

In order to relieve congestion in loading and unloading cars in the business districts of New Bedford the Union Street Railway last year adopted the plan of collecting fares on entrance on inbound cars and as the passengers leave, on outbound cars. Cars now move more rapidly through the business sections of New Bedford and the change has proved popular with patrons. The same plan was adopted on buses by the United Railways & Electric Company, in Baltimore, with satisfactory results.

In New Bedford, the railway finds that an unusually large force of street men for a railway of its size conduces to good service. These men — starters, inspectors and the instructor — are an insurance against infraction of the rules and assist materially in keeping cars properly spaced and on schedule.

Extensive Re-Routing in Charleston

Another solution of the service improvement problem was found in Charleston in a comprehensive re-routing of all of the city lines. The routes were laid out with a view to: (a) eliminating duplication of service, (b) avoiding as far as possible the most congested sections, (c) giving service direct between points of greatest travel, and (d) withdrawal of service from territory unproductive of traffic.

The Aurora, Elgin & Fox River Electric Company also improved service in Elgin last year by re-routing. Formerly cars there terminated their runs at the Public Square, an inconvenience for cross-town riders. Now the cars are through-routed with marked satisfaction to the patrons.

In its new safety cars the latter company has had separate entrance and exit doors installed, with the result that time is saved in loading and traffic congestion in business districts is minimized.

It is sometimes possible also to facilitate car movement by slight track changes. For example, the United Railways & Electric Company has recently adopted the clearance curve on double-track lines. In renewals of track the tracks are so spaced as to give clearance to cars rounding them in opposite directions. This facilitates the movement of cars, tends to speed up traffic and relieves congestion generally.

A Gasoline-Driven Car Ferry

A service betterment of unusual form has been made by the San Francisco-Sacramento Railroad in the installation of a new steel-hull car ferry boat for transporting trains across Suisun Bay. The design of this boat, as pictured in Plate VI, is original with the railway management. The boat is constructed of structural steel shapes, and provides deck room for three tracks, 220 feet long. These are arranged to hold three 60-foot cars on each side, or three on the center track. The barge weighs about 775 tons.

The motive power is supplied by a 600-horsepower gasoline engine, with eight cylinders of 15¼-inch by 20-inch bore. They are arranged eight in a row on the crankshaft, and directly connected to the propeller on each end by a multiple-disc clutch. The engine runs continuously in the same direction, the pitches of the propellers being opposite.

Gasoline-engine drive was selected for the barge on account of its economy for this service as compared with steam-driven boats. The time of crossing the bay is but ten minutes, while there is an hour layover, hence there is a substantial saving in standby losses.

A dining room is operated on this boat for the convenience of passengers, and the deck is filled to the top of the tracks so that they can leave the trains and enjoy the trip across the bay.

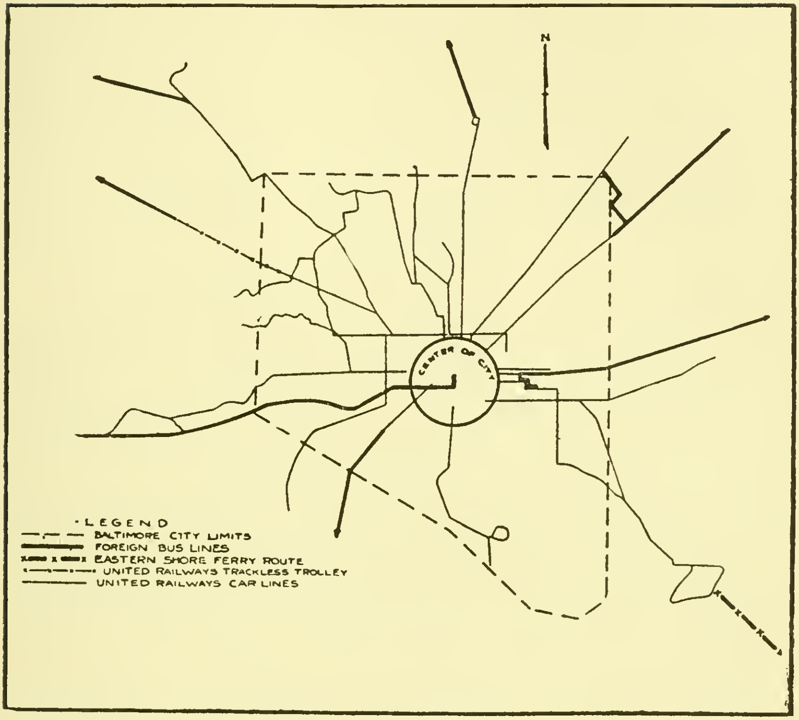

N
CENTER OF CITY
LEGEND
BALTIMORE CITY LIMITS
FOREIGN BUS LINES
EASTERN SHORE FERRY ROUTE
UNITED RAILWAYS TRACKLESS TROLLEY
UNITED RAILWAYS CAR LINES

Diagram showing foreign bus-line connections in Baltimore

Co-ordinated Transportation Service

Previous to 1924 it was necessary for the patrons of an outlying section of New Bedford to walk a considerable distance to reach the car line. Realizing its responsibility to these people, and the retarding effect on the community of lack of adequate transportation, the Union Street Railway voluntarily inaugurated bus service at this point. While this line is not self-supporting it will show if and when further service is required and the time, if ever, at which the trolley line should be extended.

In Baltimore special attention has been given this matter of co-ordination of bus, trackless trolley and rail service. The United Railways & Electric Company uses an unusually complete variety of these services, involving multiple-unit trains, motor cars and trailers, Peter Witt cars, 1-man cars, motor buses and trackless trolleys. It claims to have been the first railway in the country to adopt a unified system of all forms of street transportation to meet the needs of the traveling public, and its practice is therefore of unusual interest.

On this property considerable progress was made in the period covered by its presentation in the further co-ordination of subsidiary bus and trackless trolley lines with the street railway service. New auxiliary lines were established or extended and general improvement marked the adjustment of the schedules of these to those of the connecting car lines. Two supplementary bus lines, each three miles long, are operated without transfers to and from street cars. The fare on these is ten cents.

Three feeder bus lines serve sections into which it would be unreasonably expensive to build street car lines and they are maintained for the convenience of the residents of the territory they serve. The fare is the same as on the street cars, and free transfers are issued between them and the trolley cars.

The trackless trolley traverses a suburban route, sparsely settled, 6.6 miles long.

At the behest of the Public Service Commission of Maryland, the "United Railways" recently acquired the Baltimore & Belair Electric Railway, which operated a single-track line extending from a terminus of one of the city lines. The "United Railways" now operates all electric railway transportation in this territory, with the exception of a very small electric railway line connecting with the terminus of one of its lines, and the Washington, Baltimore & Annapolis Electric Railroad — an interurban line — which operates into the city.

Co-operation With Other Transportation Agencies

Although not an operator of buses itself, and protected from improper bus competition by the Railroad Commission of California, the San Francisco-Sacramento Railroad has, as it reports, " not turned a deaf ear to the merits of motor transportation." It has put into effect through rates and joint schedules with authorized existing motor carriers connecting with its line where these have obtained permits from the commission to operate in territory beyond the railway line. A sample of this co-operation is shown in a billboard advertisement reproduced in Plate XII, which shows the joint service of the Pierce Arrow Stage and this carrier from San Francisco to Lake Tahoe, a trip 93 miles by railroad and 111 miles by stage.

This railway also operates in conjunction with the Sacramento Northern Railroad a through passenger service from San Francisco to Chico, a distance of 183 miles, which has now been in operation for ten years. When started this was the longest through run of the kind in the country. Passenger observation parlor cars are run through from terminal to terminal.

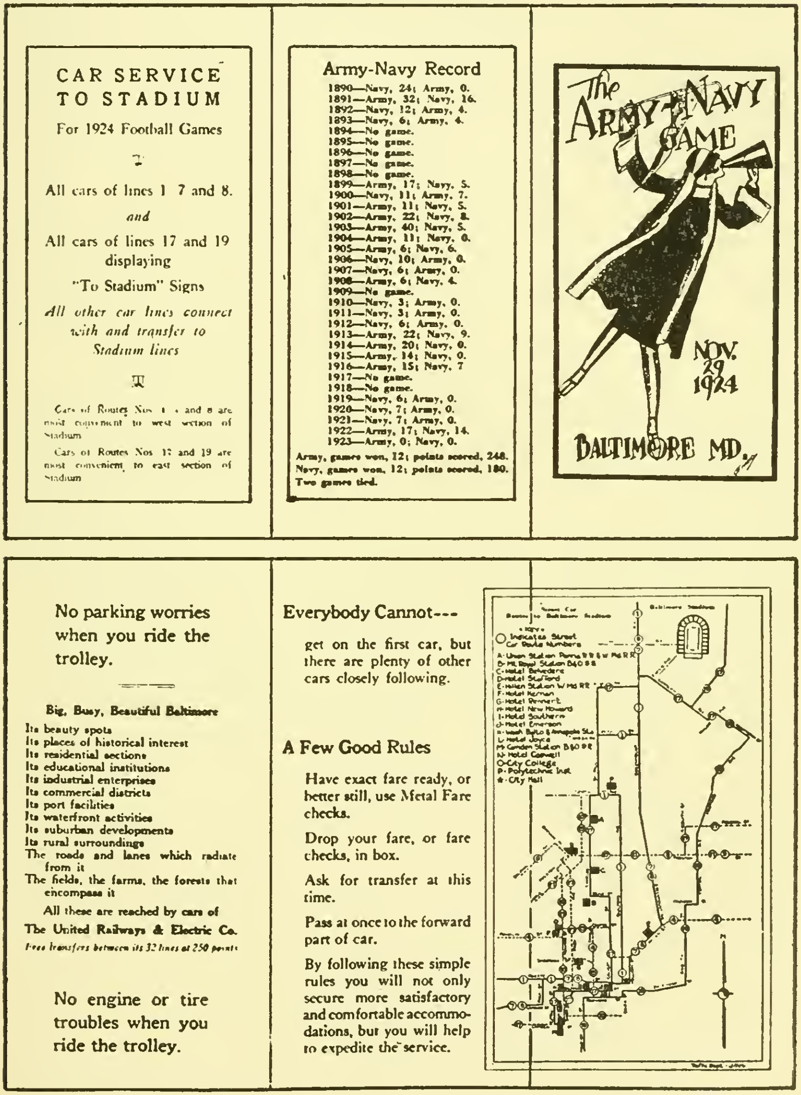
In closing this list of examples of co-ordinated service it is appropriate to take one from the freight field. A notable expansion of shipping facilities in the territory of the Interstate Public Service Company resulted from its recent formation of a connection with the Southeastern Express Company, of Atlanta, Ga. This operates over some of the largest railroads south of the Ohio River. By this connection the " Interstate " has opened up a new express route, not only for the freight from the North but from the South as well.

Original Color Scheme For Dash Signs

In Fort Worth all cars which do not turn through to the end of a line carry special dash destination signs. These are of sheet iron, 12 inches by 20 inches in size. In connection with these signs a color scheme has been worked out to indicate also the turnbacks. For example, on a line with four turnback points, the following is the plan: White background with black letters shows destination, and that car turns back at the first turnback point; red background with white letters, destination and second turnback point; green background with white letters, destination and third turnback point; and black background with white letters, destination the end of the line. The use of the signs has greatly reduced the necessity for transferring passengers who otherwise inadvertently might have boarded the wrong car.

In Baltimore during the past year new signs have been devised for the side windows of the cars near the rear end. They show the route number and destination, and supplement the line number and destination signs displayed at the front of all cars.

Some kind of a guide folder is highly desirable in connection with any kind of electric railway service. In Baltimore an unique map and street railway directory has been developed, showing the city and vicinity, with each route indicated thereon, and a tabulation giving a complete roster of the streets covered by each route is printed on the reverse of the map.



CAR SERVICE TO STADIUM

For 1924 Football Games

All cars of lines 1 7 and 8.

and

All cars of lines 17 and 19 displaying "To Stadium" Signs

All other car lines connect with and transfer to Stadium lines

Cars of Routes Nos 1 7 and 8 are most convenient to west section of Stadium

Cars of Routes Nos 17 and 19 are most convenient to east section of Stadium

Army-Navy Record

1890—Navy, 24; Army, 0.
1891—Army, 32; Navy, 16.
1892—Navy, 12; Army, 4.
1893—Navy, 6; Army, 4.
1894—No game.
1895—No game.
1896—No game.
1897—No game.
1898—No game.
1899—Army, 17; Navy, 5.
1900—Navy, 11; Army, 7.
1901—Army, 11; Navy, 5.
1902—Army, 22; Navy, 8.
1903—Army, 40; Navy, 5.
1904—Army, 11; Navy, 0.
1905—Army, 6; Navy, 6.
1906—Navy, 10; Army, 0.
1907—Navy, 6; Army, 0.
1908—Army, 6; Navy, 4.
1909—No game.
1910—Navy, 3; Army, 0.
1911—Navy, 3; Army, 0.
1912—Navy, 6; Army, 0.
1913—Army, 22; Navy, 9.
1914—Army, 20; Navy, 0.
1915—Army, 14; Navy, 0.
1916—Army, 15; Navy, 7
1917—No game.
1918—No game.
1919—Navy, 6; Army, 0.
1920—Navy, 7; Army, 0.
1921—Navy, 7; Army, 0.
1922—Army, 17; Navy, 14.
1923—Army, 0; Navy, 0.

Army, games won, 12; points scored, 248.
Navy, games won, 12; points scored, 180.
Two games tied.

The ARMY-NAVY GAME
NOV. 29 1924
BALTIMORE MD.

No parking worries when you ride the trolley.

Big, Busy, Beautiful Baltimore

Its beauty spots
Its places of historical interest
Its residential sections
Its educational institutions
Its industrial enterprises
Its commercial districts
Its port facilities
Its waterfront activities
Its suburban developments
Its rural surroundings
The roads and lanes which radiate from it
The fields, the farms, the forests that encompass it

All these are reached by cars of

The United Railways & Electric Co.

Free transfers between its 32 lines at 250 points

No engine or tire troubles when you ride the trolley.

Everybody Cannot---

get on the first car, but there are plenty of other cars closely following.

A Few Good Rules

Have exact fare ready, or better still, use Metal Fare checks.

Drop your fare, or fare checks, in box.

Ask for transfer at this time.

Pass at once to the forward part of car.

By following these simple rules you will not only secure more satisfactory and comfortable accommodations, but you will help to expedite the service.

An example of the special folders which are distributed by the "United Railways"

It is the custom of the United Railways & Electric Company, upon any occasion when a large assemblage is expected, to issue special literature giving directions for reaching the point where the gathering is to be held. This is illustrated by the folders issued for each football game at the Venable Stadium during the fall of 1924, as shown on page 21.* These folders are simple, easy to read, and a great help particularly to strangers.

The Union Street Railway distributes a pocket timetable to patrons, showing its entire service in convenient form. The route numbers are displayed in large type.

Industrial Department Builds Business

An outstanding achievement of the Interstate Public Service Company is its industrial department. While this dates back some years and was mentioned in last year's presentation, it is worthy of more extended notice due to its recent development. In this work an industrial agent is employed who devotes his entire time to improving industrial conditions in "Interstate" territory and to obtaining new industries for it. He also studies possible real estate and agricultural development.

Surveys are made to determine the types of industries that may be economically located and operated in towns and cities served by the railway. These surveys cover population, tax rate, transportation facilities and other utility service, labor and living conditions, raw material available, factory sites and special advantages which the communities have to offer to manufacturers.

The industrial agent attempts to get in touch with manufacturing concerns which are seeking location, and to impress upon them the advantages of the " Interstate " territory. As a direct result of this work Colgate & Company decided to locate a large soap plant at Jeffersonville, Ind., purchasing a 48-acre site and twenty buildings from the State for $450,000. More than 3,000 people will be employed. This is one of the most important industrial additions to Southern Indiana in many years.

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* A later folder was substituted for the one submitted with the "brief."

The department also secured a number of industries for New Albany, Ind., of which one employs 400 people; and also co-operated with Chambers of Commerce in securing others.

The company is satisfied that its industrial department builds business, establishes permanent industrial institutions for the communities it serves and improves relations with the public.

Helping the Farmer to Plant Wisely

In addition to its industrial work, the plans which have been developed in the agricultural field by the Interstate Public Service Company are worthy of study. One of its leading policies is to interest land owners in its territory in the production of crops which will be most profitable to them. A consistent effort is also made to promote the feeding of stock and to develop the dairy industry. Also, through the company's efforts, land that seemed of little value has been turned into farms which are profitable because the railway opens up good markets for melons and small fruits such as blackberries, raspberries and strawberries.

The farming problem was analyzed in three phases: (1) production, (2) transportation and (3) marketing.

To insure efficient production, the "Interstate" employed agricultural experts to study the soil in its melon and fruit growing territory and to advise farmers as to the products which they could raise most profitably.

Next, transportation methods were developed to facilitate the shipping of fruit. Last year the company provided stock cars in which large growers sent their melons to the markets in Indianapolis, and other cities, selling them from the cars. The result was highly satisfactory to both shipper and railway, and was repeated in 1924. The railway's traffic experts work closely with the shippers to determine the best and cheapest ways of handling produce. Freight rates are made as low as possible consistent with good service. Fast night freight trains between Indianapolis and Louisville permit the shipping of perishable produce without refrigeration. These experts also seek new markets for the farm products and assist the farmers in holding those that they already have.

This co-operation in the fruit growing territory has resulted in a five-fold increase of business in three or four years. A similar result has been secured for the canners who are located along the line. Help rendered the canners has brought about large increases in acreage devoted to tomatoes, peas and other vegetables, with accompanying greater employment opportunities.

Making the Most of a Local Opportunity

The Interstate Public Service Company is located in a territory where live stock is one of the principal industries. The Indianapolis stockyards are among the largest of the Middle West and there are large yards in Louisville also. The railway company has studied the needs of the stockmen and has attempted to meet these needs. It has permitted the stock raiser practically to make his own operating schedule, and grants low freight rates to the yards.

During the past year the company has experimentally introduced a double-deck type of car for sheep and hogs, thus permitting more economical use of the equipment. It also obtained entrance to the Bourbon Stock Yards at Louisville, one of the most important yards south of the Ohio River. It put a low "feeder" rate on cattle, sheep and hogs from the terminal yards so that the farmers are increasingly taking advantage of the opportunity over the "Interstate" lines to secure stock to fatten.

The dairy industry offered another opportunity to this company. To induce more interest in dairying, members of the faculty of the agricultural school at Purdue University were secured to lecture on the subject to the farmers in the territory served by the railway. In the lectures the farmers were urged to invest in pure-bred cattle to insure good returns. In this field the company has been co-operating with the Farmers' Federation and the county agricultural agents who are working along the same lines.

The San Francisco-Sacramento Railroad also has been unusually successful in getting industries to locate along its lines. It has followed the principle that when an industry locates on a railway line its business is assured to that railway. At the town of Walnut Creek, for example, there are ten industries located on this company's rails, while the competing steam railroad has very little business from this point. When the electric service was inaugurated, this steam road was the only railroad facility for the community and some of the industries now served by the electric line were on the steam line.

Drainage and Irrigation District Formed

There is a large amount of undeveloped land lying along one section of the San Francisco-Sacramento Railroad, comprising about 200,000 acres. The railway management has been instrumental in forming committees of the land owners in this district and has had investigations made by the University of California to determine the adaptability of the soil for certain desirable crops. The result has been the formation of a "drainage and irrigation district," and the land will be improved with a view to bringing in settlers. The company has advertised to farmers the advantages of settling on this land, and has turned over to the owners the inquiries received so that they could make arrangements for purchases. Ultimately this will mean increased business for the railway.

In developing its freight business, the San Francisco-Sacramento Railroad employs freight solicitors in its traffic department whose duty it is to solicit freight business daily in San Francisco, Oakland, Sacramento and points adjacent to the company's line. Part-time solicitors are also employed in Chicago, Detroit, St. Louis, Pittsburgh, Buffalo and Birmingham to secure carload business destined to or by way of the company's line to or from Pacific Coast points.

A salutary lesson in real estate development has been taught the city of Fort Worth by the Northern Texas

Traction Company. As in all growing communities, the railway here was embarrassed by the demands for extensions of lines to serve new outlying communities. These could not promise paying traffic for years, while the company was convinced that there was ample undeveloped real estate along its lines to serve the needs of the city for years to come.

During 1923 the company decided to make an accurate count of all vacant residential building lots within four blocks of its lines in any direction. There were found to be 24,000 of these. The distance of four blocks was selected because that was assumed to be the maximum that would be satisfactory to Fort Worth residents.

This information was placed before the public by means of car cards and newspaper advertising, the conservative number of 20,000 lots being used in the campaign of education. The results proved to be entirely satisfactory, as the public was convinced that the railway had anticipated its needs long in advance, and that it was an imposition to ask it to build and extend lines when the present lines could serve 100,000 more people. Building lots adjacent to the railway are now booming, and the development of "short-haul" real estate is well under way.

Developing Special Car Business

One of the duties of the general passenger agent of the Northern Texas Traction Company is to secure special car business over either the interurban or city lines. He has been successful in this largely, it is believed, through the company's practice of hanging large signs on the special cars or trains stating the identity of the parties using the service and their destination. These signs are placed by the company without charge. They please the passengers, who like the attention that the signs attract, and they advertise the special service.

Amusement Parks and Special Excursions

Although the amusement park does not have the large place in the scheme of electric railway transportation that it did at one time, there are still many conditions under which the general rule does not apply. Take for example the case of Charleston. One comment which frequently reached the ears of the railway management there was that the railway " doesn't take you anywhere," *i. e.*, anywhere for a good time.

The park problem in Charleston is a complicated one. For white people there are two parks, one public, the other private. The railway has tried to co-operate with the city in offering attractions at the public park, but with little success. The private park is reached largely by automobile users. In neither case can the railway get a return on special efforts to induce traffic. With the colored people the situation is somewhat better.

A property known as Grant's Park, located on a suburban line about a mile from the city limits, was operated successfully by the railway before the war. After the war the slump in the fertilizer business resulted in a migration of negroes to the North and those who are left are not sure of steady work and high wages. However, it seemed as if the railway ought to do something for the colored people and it canvassed the situation carefully. Grant's Park seemed to be the answer, if arrangements could be made to operate it economically.

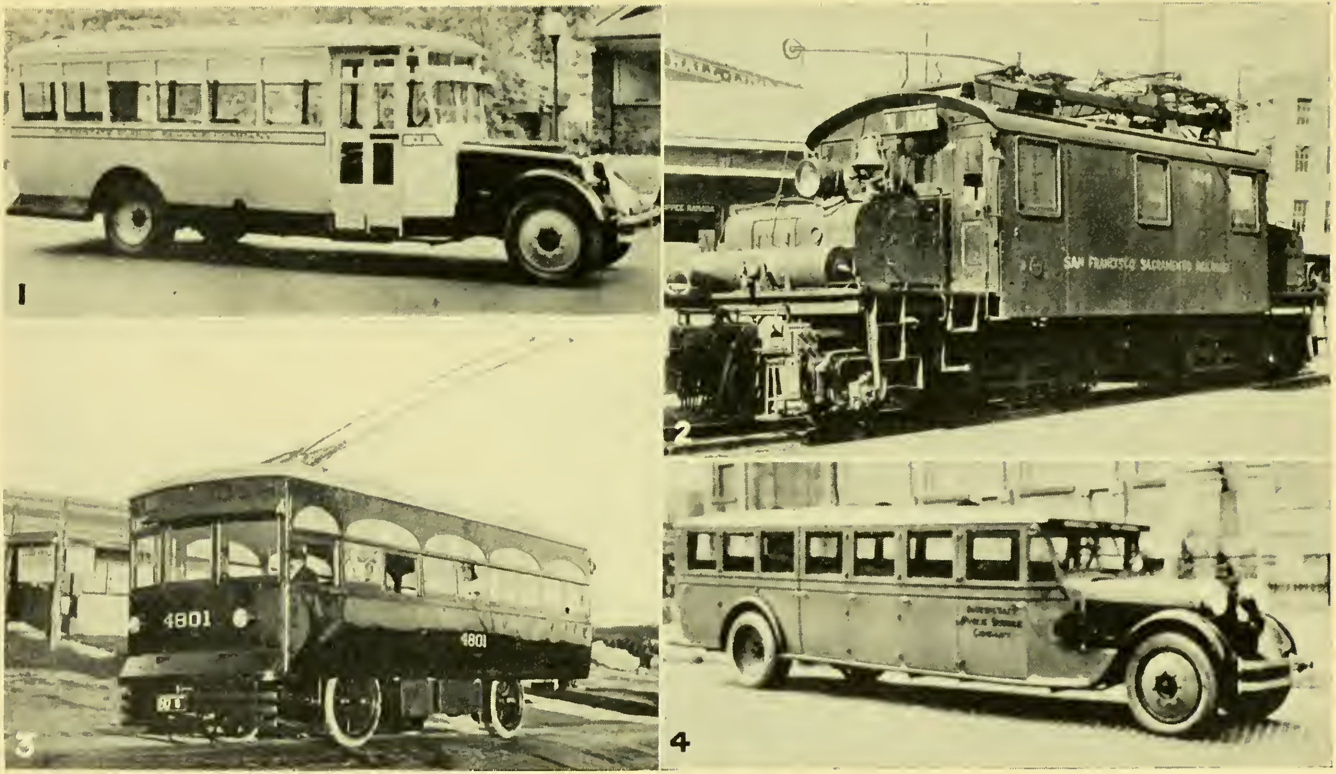


PLATE V — (1), (4) *Two latest types of bus used on "Interstate" interurban route.* (2) *Freight locomotive of San Francisco-Sacramento Railroad.* (3) *Trackless trolley car, Baltimore.*

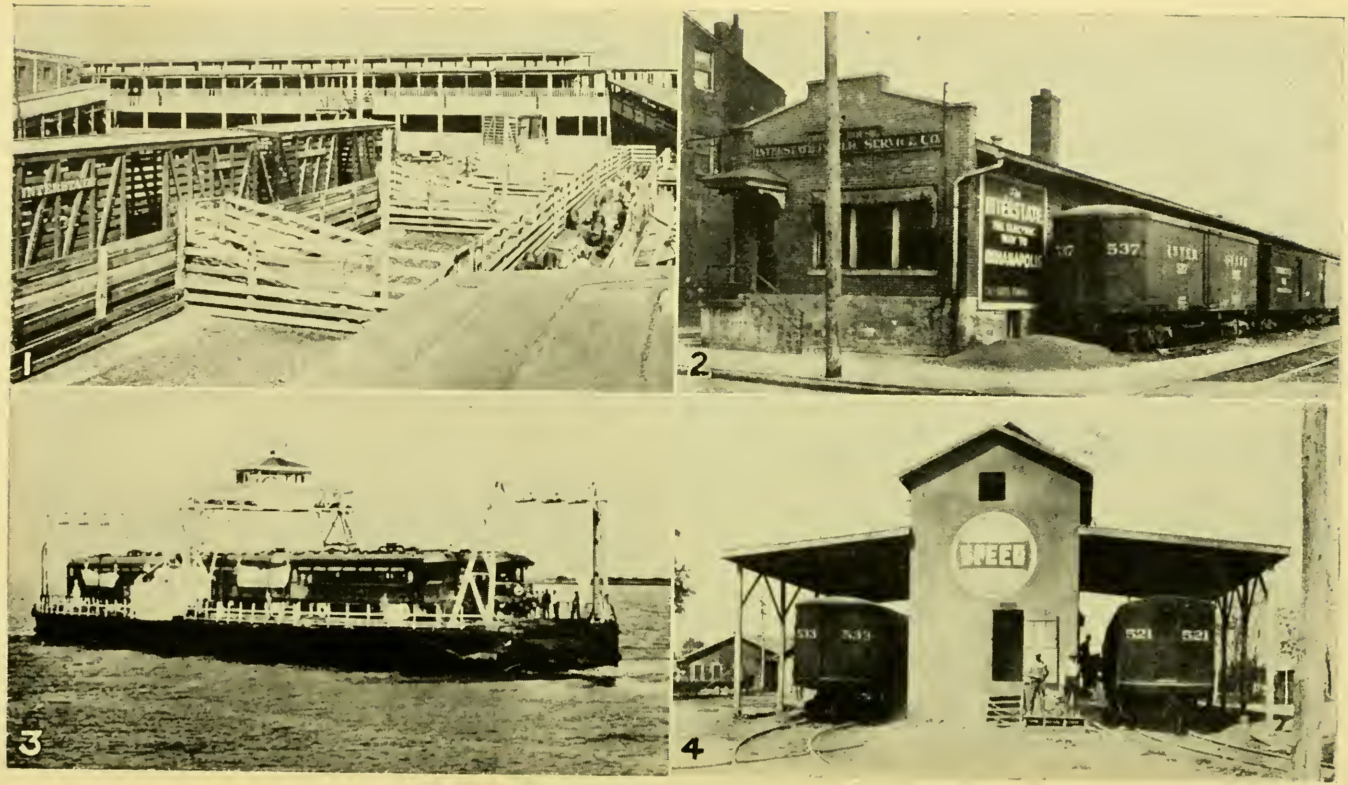


Plate VI — (1) *Cattle-loading platform at stockyard, Interstate Public Service Company.* (4) *Cement-loading plant, same.* (2) *Joint freight terminal in Indianapolis.* (3) *Car ferry, San Francisco-Sacramento Railroad.*

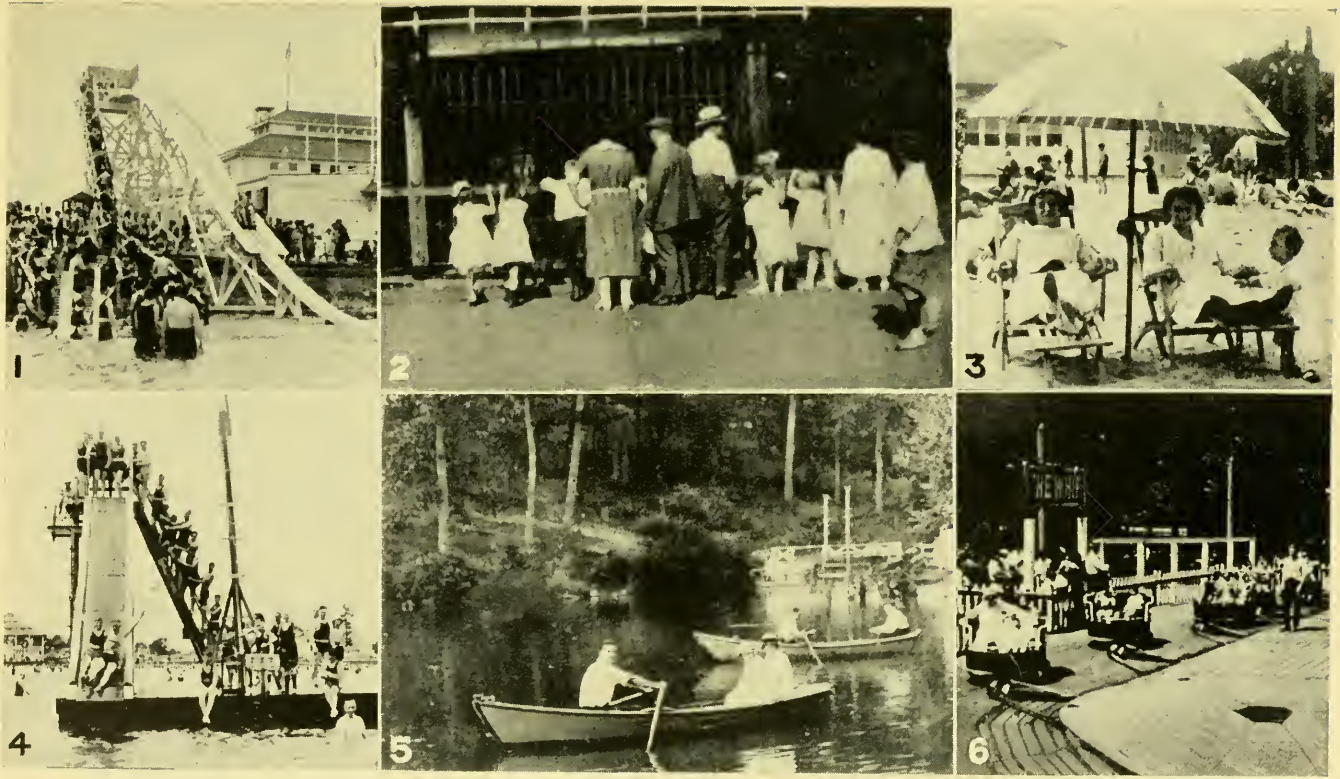


Plate VII — *Views in " United Railways " two amusement parks.* (1), (4) *" Slippery slides."* (2) *Caged animals, always a center of interest.* (3) *Beach scene, Chesapeake Bay.* (5) *Rowing is made much of.* (6) *Thrills for those who want them.*

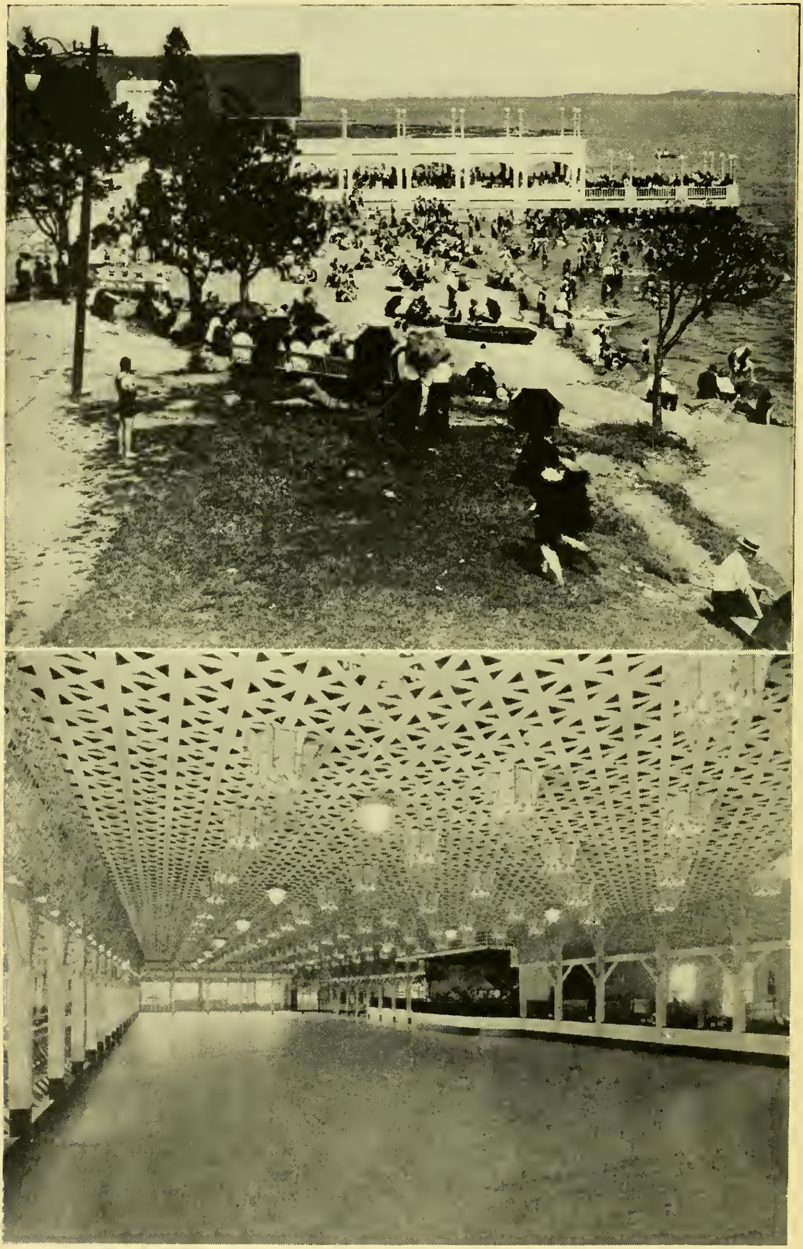


Plate VIII — (Above) *Beach scene at Fort Phoenix, Union Street Railway.* (Below) *Largest dance hall in New England, Lincoln Park, same.*

Finally this arrangement was entered into with the owners and has resulted in a reasonable profit and an assurance that the colored people would have a suitable amusement place: The owners agreed to operate the park from Apr. 21 to Sept. 30, 1924, the railway to furnish music and prizes under specified conditions, a specified amount of electrical energy for lighting, and a sum of money to help in making repairs. An equitable division of the gate receipts and of the railway fares which included admission to the park was arranged.

After allowing for extra car service, supervision, music, repairs, etc., the returns to the railway for two months' operation was over $1,100.

"United Railways" Has Fine Parks

The United Railways & Electric Company operates two of the finest summer amusement parks in the country; one a shore resort on Chesapeake Bay, the other a woodland park. No admission is charged to either, and good roads to, and automobile storage in the parks are provided to attract the friends of the railway who desire to visit the parks in their private cars. In order that these resorts may be operated so that every father and mother will feel safe in taking the family on an outing, or allowing the children to visit the parks, the latter are carefully supervised by the company officials and employees.

Sunday schools, private parties, fraternal organizations, etc., hold their outings at these places, and business firms give annual outings to their employees there. By careful management, during the past three years the parks have been placed upon a self-supporting basis, the present park organization having turned the " net " from a continued deficit to a profit of $30,000 to $50,000.

The company lent its support to the Baltimore Flying Club in securing the Jacques-Schneider International Sea-Plane Race for Baltimore in the fall of 1924, proffering free of expense the use of Bay Shore Park with its magnificent advantages for such an event.

The Union Street Railway also operates two amusement parks, one, Lincoln Park, midway between New Bedford and Fall River, the other, Fort Phoenix, located in Fairhaven, which adjoins New Bedford. The former is in a delightful pine grove, the latter on the shore with a fine bathing beach. These resorts are considered to be among the finest that are available in Southern New England.

At Lincoln Park the aim has been to make the dance halls the center of interest, keeping everything about them and the rest of the park of high class. A Boston orchestra has been employed to furnish music for dancing, a charge of 35 cents per person being made. The main dance hall accommodates 1,400 persons and it is in demand for private parties within a radius of many miles. Every year the hall is repainted in white and green, the prevailing colors in the park, and new decorations are hung.

Last year Lincoln Park was fenced in and a charge of 10 cents per person was made for those not coming by trolley. No charge was made for automobiles. Instead of the expected decrease in automobile passenger patronage there was a 30 per cent increase.

At Fort Phoenix thousands of people find relief from the warm weather each season. There is here a large bathing house and pier, and a clam-bake house. The clam bakes enjoy a fine reputation in the neighborhood.

Last year, to advertise these parks, the Union Street Railway distributed 10,000 paper match folders. These were placed in cigar stores, drug stores, summer hotels, etc., within a radius of 50 miles, to promote traffic to the park.

Excursions of Various Sorts

Companies that do not own or operate parks have an opportunity to conduct excursions to points of interest. The Interstate Public Service Company conducts Sunday excursions throughout the spring, summer and fall between Indianapolis and Louisville. It also provides summer tourist rates, good from May 1 to Oct. 3, from all points of its territory to the Northern Indiana lakes. There is good evidence that this plan has materially increased the travel on the company's lines. Special attention has been given to assigning to the operation of the trains men carefully trained for their work and instructed to use every effort to add to the comfort of the company's patrons.

The San Francisco-Sacramento Railroad has been instrumental in promoting trips to points on its lines for such organizations as the Rotary Club, the Lions' Club, and the Elks and other fraternal orders. These excursions are in charge of representatives of the railway's traffic department, who accompany the parties on going and return trips.

In the Redwood Canyon, nine miles out of Oakland, the San Francisco-Sacramento Railroad developed two picnic parks, to which picnics are taken at frequent intervals under the direction of the traffic department.

The season opens the first Sunday in May and continues through September. The parks have become so popular that every Sunday and holiday for the season of 1924 was practically arranged for before the season opened. Each picnic is " personally conducted."

CHAPTER III

Advertising the Service

ELECTRIC railways generally are becoming convinced of the value of telling their story to the public. Among the means used in doing this, as reflected in the 1924 presentations, are radio broadcasting, special advertising cars and displays on regular cars, newspaper news " stories " and paid advertisements, displays at exhibitions, periodical publications and special pieces of printed matter, motion and still pictures, billboards and talks before audiences of various kinds.

Undoubtedly radio offers one of the best means for distributing information, and it was used with good effect in Baltimore last year in connection with the celebration on March 24, 1924, of the " United Railways' " 25th anniversary. The first entertainment was a " Radio Birthday Party," broadcast from station WEAR, all the music and talks being by " United Railways " people. Five-minute talks were given as follows: " Your railway's birthday," " Women " (by a woman conductor); " Horse-car days," " Things left in the cars," and " Best humor of the railways." It was estimated that 8,000 local stations listened in on this occasion. Later a " Radio Concert " was broadcast from station WCAO, the program being entirely musical. Selections were played by the " United Railways " band, and the railway's male chorus and soloists gave several numbers. As indicated by the letters received, an even larger number of stations listened in.

The "White Cars" Effective in Fort Worth

While radio is a novel form of advertising there is much that can be done with existing equipment by means of a little originality. This was illustrated last year in Fort Worth, where the Northern Texas Traction Company painted two cars in an unusual way, lettered them with catchy phrases and circulated them for a month in regular service on different lines to impress the electric railway story.

These two sales cars were typical of those used in the city. One was a double-truck, 1-man car, the other a single-truck, standard Birney car. The bodies were painted a dazzling white, the trucks black and the window sash mahogany. Slogans and catch words were lettered in black on the sides of the cars, the phrases being suitable for tying in with a newspaper and general publicity campaign.

The dash wording on each end of the car was as follows: To the left of the headlight was " Howdy," a typical Texas greeting word; to the right " Glad to serve you," and below, " Let's Go." On the letterboard on each side was a phrase which the company has firmly fixed in the mind of its patrons in various ways, " Ride the street car and save the difference." Other phrases on the sides were " Our service is a shopping convenience," " You don't have to park your street cars," " The convenience of our service is increasing daily," " We appreciate your patronage " and " Think it over."

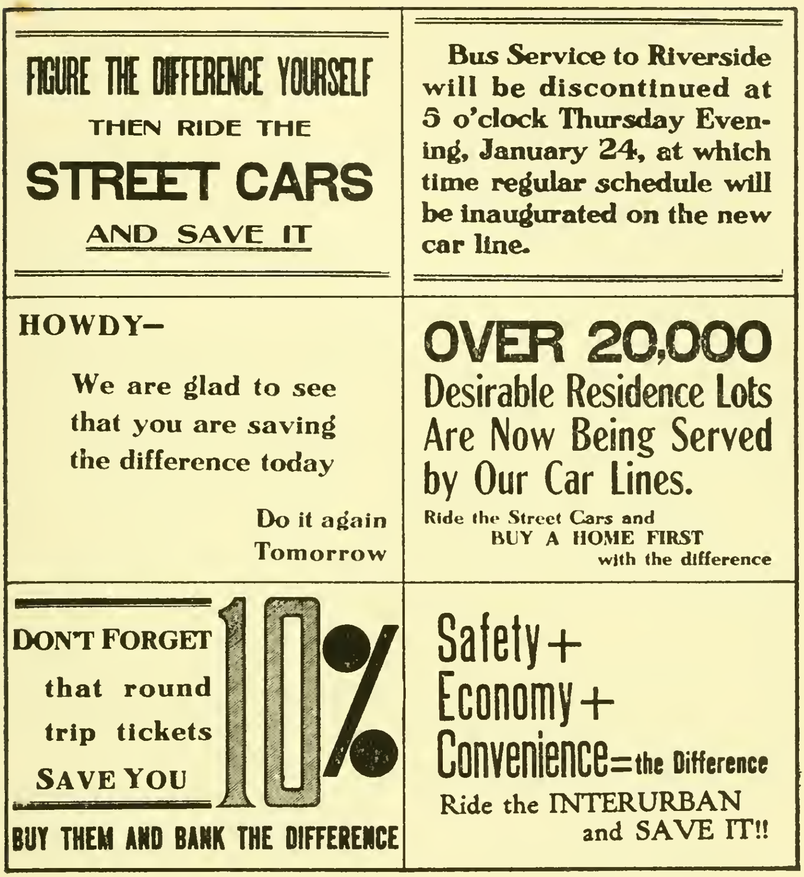


FIGURE THE DIFFERENCE YOURSELF
THEN RIDE THE
STREET CARS
AND SAVE IT

Bus Service to Riverside will be discontinued at 5 o'clock Thursday Evening, January 24, at which time regular schedule will be inaugurated on the new car line.

HOWDY—
We are glad to see
that you are saving
the difference today
Do it again
Tomorrow

OVER 20,000
Desirable Residence Lots
Are Now Being Served
by Our Car Lines.
Ride the Street Cars and
BUY A HOME FIRST
with the difference

DON'T FORGET
that round
trip tickets
SAVE YOU
10%
BUY THEM AND BANK THE DIFFERENCE

Safety+
Economy+
Convenience=the Difference
Ride the INTERURBAN
and SAVE IT!!

Car cards that have proved effective in Fort Worth

Inside, the card spaces were all filled with original legends, designed to emphasize the economy and convenience of street railway transportation.

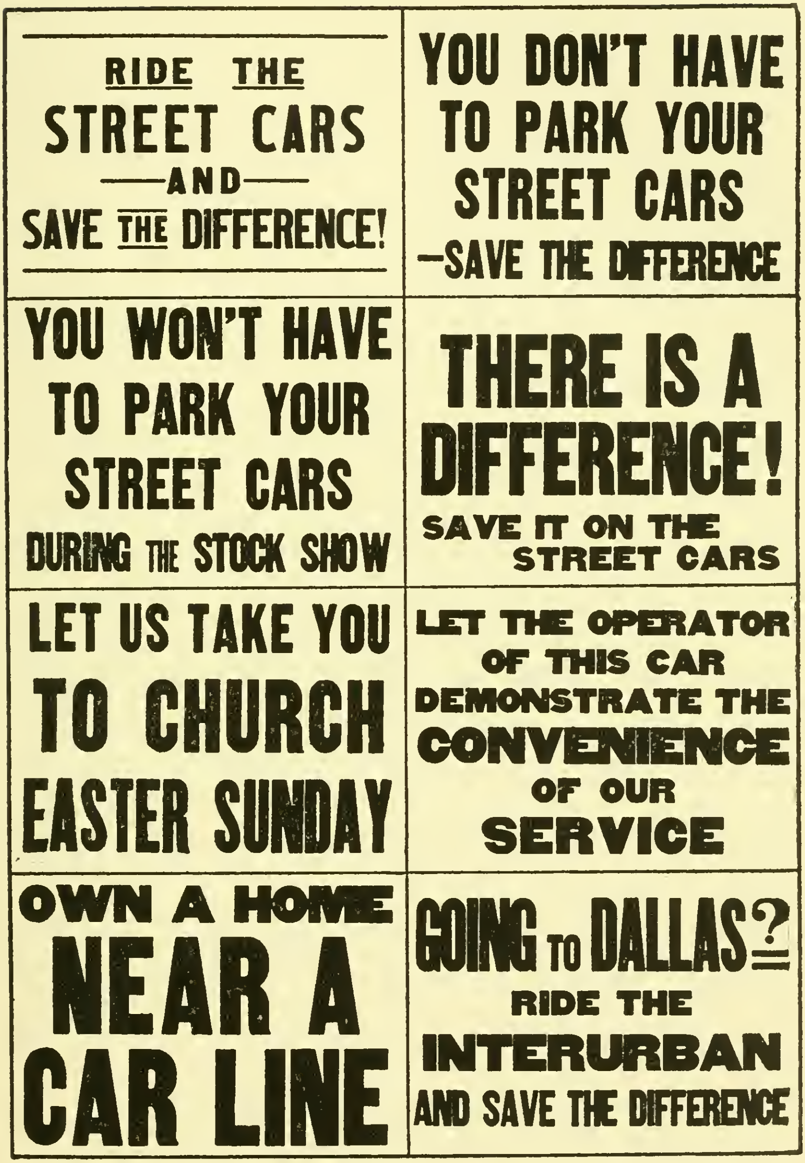
The cars were operated on regular runs in charge of trainmen-instructors dressed as follows: White caps, similar to those worn locally by police officers, with "Operator" in gold braid across the front; white shirts and collars; black silk coats; white flannel trousers, and black shoes. The appearance of these men on duty was striking.

To arouse the greatest possible interest in the "white cars," liberal newspaper space was used. Advertisements explained the purpose of the "stunt," and gave the schedule of routing. Other cars on the system carried dash signs lettered: "Do you believe what the 'white cars' say?" or "A memory test — can you repeat what the white cars say?" The latter question caught the public fancy, and became a common greeting. "Hello, Bill," a man would say, "can you repeat what the 'white cars' say?" Then would follow a friendly contest as to the possession of the better memory. It was practically impossible to go to any public meeting or luncheon club without hearing the "white cars" favorably mentioned.

While the results of this advertising scheme cannot be measured accurately, the management traces a substantial increase in traffic to it, amply repaying the cost of the campaign.

Special Car to Advertise Baseball Games

Another advertising "stunt" from Fort Worth is this: The city has a successful and popular baseball team in the "Fort Worth Panthers," which is an advertising asset to the city. The Northern Texas Traction Company capitalizes the popularity of the team by means of a car carrying large signs. This car is scheduled over a definite route, requiring 2½ hours to cover, and is operated whenever a local game is played. The signs convey a news message of great interest —"Ball Game Today"— and the opportunity is taken to link the railway service



RIDE THE
STREET CARS
—AND—
SAVE THE DIFFERENCE!

YOU DON'T HAVE
TO PARK YOUR
STREET CARS
—SAVE THE DIFFERENCE

YOU WON'T HAVE
TO PARK YOUR
STREET CARS
DURING THE STOCK SHOW

THERE IS A
DIFFERENCE!
SAVE IT ON THE
STREET CARS

LET US TAKE YOU
TO CHURCH
EASTER SUNDAY

LET THE OPERATOR
OF THIS CAR
DEMONSTRATE THE
CONVENIENCE
OF OUR
SERVICE

OWN A HOME
NEAR A
CAR LINE

GOING TO DALLAS?
RIDE THE
INTERURBAN
AND SAVE THE DIFFERENCE

Dash posters like these bring business with it. After the "special" run has been made, the banners are taken down and the car goes into regular tripper service between the business section of the city and the ball park.

The Northern Texas Traction Company secures considerable advertising from the French box car, described in Chap. IV and illustrated in Plate XIII, although it was not intended directly for this purpose. It also finds the dash poster an excellent means of general advertising, and has used a carefully worked out series, with posters changed every ten days. Treating the dasher as a traveling billboard, the company uses it to prove that the street railway service is convenient and economical. As on the "white cars" a fundamental slogan is: "Ride the street car and save the difference," and every dash poster carries a message which drives home this idea in some form. The campaign has been so successful that people who are asked what they intend to do when about to board a car are apt to say "Save the difference."

Whenever anything out of the ordinary is going on in Fort Worth it is featured on the dash posters. Two days before Easter Sunday they carried the message: "Let us take you to church Easter Sunday." This pleased the ministers. Thus the company has taken the familiar idea of the dash sign and, by giving it careful attention as an effective means of publicity, has secured unusually good results with it.

Relations With the Newspapers

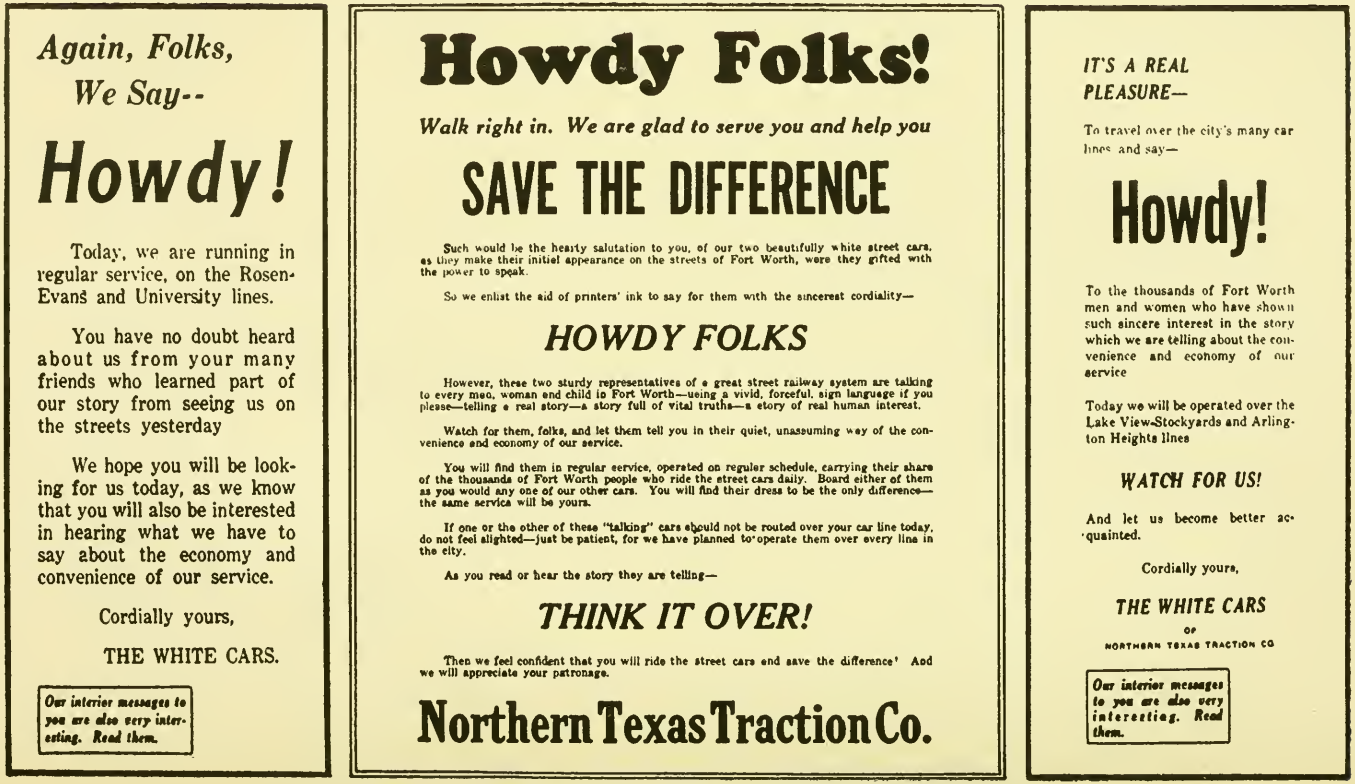
Newspaper editors are on the watch for news and they should be able to find much of it on an electric railway property. The Interstate Public Service Company has found that, while it maintains a publicity department, 90 per cent of the publicity which it gets is from news originating on the initiative of the editors. More than 95 per cent of the press material sent to the papers, however, has been used. By confining its publicity operations to real news the company has not only obtained the result which it has in mind but has established itself in the good graces of publishers, editors and other members of the editorial staffs. These last-named form an important element in utility publicity.

The "Interstate" is a firm believer in the value of advertising in the selling of its passenger and freight service. It carries on a constant campaign through newspapers in its territory to familiarize its public with its rates, train schedules and transportation facilities and advantages, frequently taking from a half page to a page in the leading papers. High school and religious papers are also included in the publicity program.

The Campaign in Charleston

Newspaper and other publicity played an important part in putting the Charleston Consolidated Railway & Lighting Company on a paying basis last year. For the first six months of 1923 there was a deficit of more than $20,000, for the same period of 1924 a surplus of nearly $23,000. The story is an interesting one from the advertising standpoint.

The campaign began in Charleston in January, 1923, with an endeavor to tell the community what service was being furnished it. Newspaper advertising, schedule cards, schedule folders, etc., were employed. Reading articles in the papers disseminated the idea of the reli-



Again, Folks,
We Say--

Howdy!

Today, we are running in regular service, on the Rosen-Evans and University lines.

You have no doubt heard about us from your many friends who learned part of our story from seeing us on the streets yesterday

We hope you will be looking for us today, as we know that you will also be interested in hearing what we have to say about the economy and convenience of our service.

Cordially yours,

THE WHITE CARS.

Our interior messages to you are also very interesting. Read them.

Howdy Folks!

Walk right in. We are glad to serve you and help you

SAVE THE DIFFERENCE

Such would be the hearty salutation to you, of our two beautifully white street cars, as they make their initial appearance on the streets of Fort Worth, were they gifted with the power to speak.

So we enlist the aid of printers' ink to say for them with the sincerest cordiality—

HOWDY FOLKS

However, these two sturdy representatives of a great street railway system are talking to every man, woman and child in Fort Worth—using a vivid, forceful, sign language if you please—telling a real story—a story full of vital truths—a story of real human interest.

Watch for them, folks, and let them tell you in their quiet, unassuming way of the convenience and economy of our service.

You will find them in regular service, operated on regular schedule, carrying their share of the thousands of Fort Worth people who ride the street cars daily. Board either of them as you would any one of our other cars. You will find their dress to be the only difference—the same service will be yours.

If one or the other of these "talking" cars should not be routed over your car line today, do not feel slighted—just be patient, for we have planned to operate them over every line in the city.

As you read or hear the story they are telling—

THINK IT OVER!

Then we feel confident that you will ride the street cars and save the difference' And we will appreciate your patronage.

Northern Texas Traction Co.

IT'S A REAL PLEASURE—

To travel over the city's many car lines and say—

Howdy!

To the thousands of Fort Worth men and women who have shown such sincere interest in the story which we are telling about the convenience and economy of our service

Today we will be operated over the Lake View-Stockyards and Arlington Heights lines

WATCH FOR US!

And let us become better acquainted.

Cordially yours,

THE WHITE CARS
OF
NORTHERN TEXAS TRACTION CO

Our interior messages to you are also very interesting. Read them.

Sprightliness is a characteristic of these interesting advertisements ability, safety and economy of the electric car. A poetry contest on the topic: "Use your street car for business — use your automobile for pleasure," aroused much interest.

The advertising was built around these ideas: The street car as a community builder, as a matter of economy, as an investment, as a time saver, as a reducer of traffic congestion and as a safe conveyance.

When the time seemed ripe the management told the people the actual condition of their street railway and asked for co-operation in saving it. This condition had been brought about by the great falling off in population after the war activities ceased, and the increased use of automobiles. For example, the revenue for June, in the several years stated was as follows: 1920, $74,300; 1921, $63,816; 1922, $51,815; 1923, $43,148. That the frank statement of facts made an impression is indicated by this editorial from the "Charleston American:"

Giving the Public the Facts

It is stated by the Consolidated in an advertisement published yesterday that, exclusive of the interest on investment and depreciation, the street car system in Charleston lost $5,252.68 in January and $5,200.64 in February of this year. This means, as we understand it, that the operating expenses of the street railway company are now running around $60,000 a year more than the revenue.

Obviously this is a serious situation for the company. It may well become serious for the city as well. The company does not misstate the case when it says that "without the trolley, Charleston would go back at least 25 years." Charleston is not going to be without the trolley but Charleston wants a street car system in which the public can take pride. The company cannot maintain such a system under the changed conditions which have come about except with the co-operation of the public.

It seems to us that the Consolidated is on the right line when it prints the facts regularly as it is now doing, laying matters frankly before the public and inviting the public to lend its co-operation wherever practicable in making and keeping the system what the interests of the community require.

The Union Street Railway has used recently an effective small front-page box advertisement, in which the name of the railway is not mentioned and which is changed frequently. Each card carries the phrase "21 rides for $1." Among the sentences featured have been these:

"Collisions aren't made or premeditated, they just happen— and they occur even with the best of drivers. Ride in the trolley cars and stop worrying."

"'Nothing free but air,' growls the man who drives. Ride in the street cars and smile.

"Cars may come and cars may go, but the street cars roll on — forever.

"'I fool the traffic officers all right. After the time limit each hour I go out and move my car.' Is he fooling himself?"

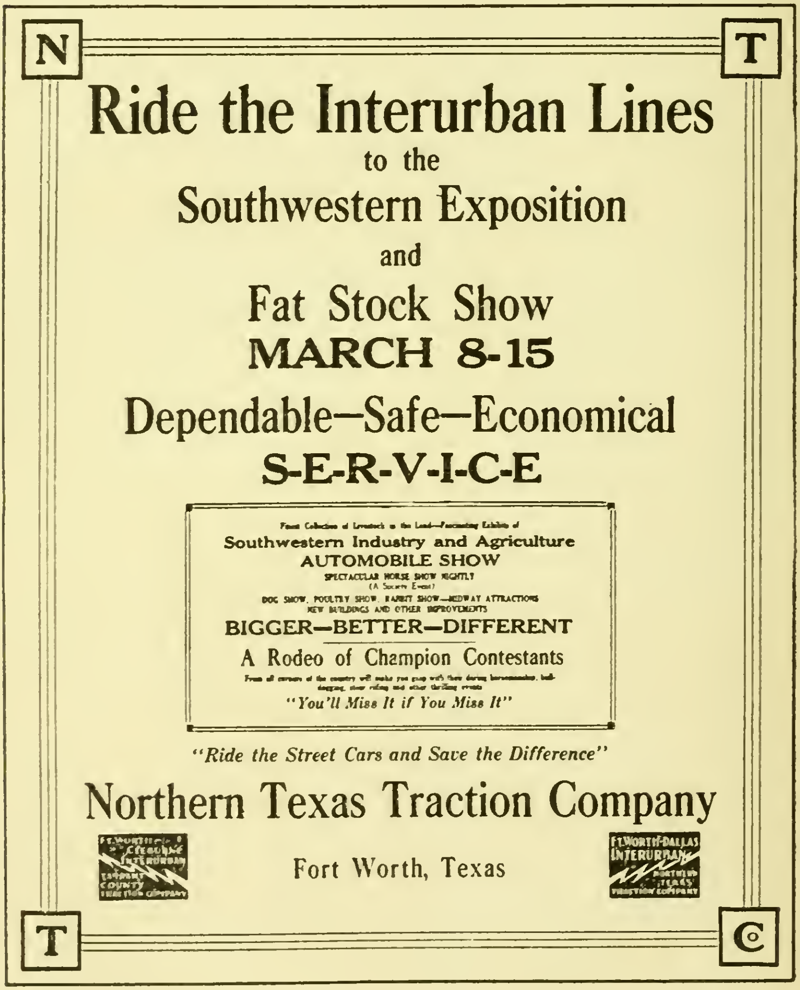
The Interstate Public Service Company makes a special feature of advertising in high-school papers published in the cities in its territory. The theory in the use of this space is that it not only calls the favorable attention of the public to the company but it advertises the service to the coming generation with which it must deal within the next few years. The company is interested in this form of advertising not so much from the point of getting business at this time but from the possibility of creating better relations in the future with the boys and girls who will make use of its lines later on for themselves. The religious and farm papers are also well patronized by the company.

Further illustrations of the use of newspapers will not be necessary as the fundamental principles are few and have been covered. Illustrations of typical advertisements are given in accompanying illustrations. There are also other forms of advertising which depend for their value upon taking advantage of some special opportunity.

A Liberal Advertising Appropriation

One-half of one per cent of the gross revenue of the Northern Texas Traction Company is spent on newspaper advertising. A special newspaper campaign was put on in connection with the " white cars " and proved effective in directing interest to them. Large space is frequently used for " smash " advertisements, impressing a message by means of a few words printed in large letters, that is, something of a poster effect. At other times the copy is tied in with special advertising, such as real estate additions, the opening of a new car line, the opening of the baseball season or special feature sections issued by the newspapers. City and interurban service is advertised regularly in all three Fort Worth newspapers, as well as in labor and church weeklies. The interurban service is advertised in the Dallas dailies and a hundred weekly papers within Fort Worth's trade territory.

The company does not use a " press agent " although it has an efficient publicity director, but is constantly doing interesting things which make good newspaper copy. In other words, it does not believe in letting the people in its community forget that they have a street railway. Recently when the company completed a new paint shop, the Fort Worth Salesmanship Club was entertained at a luncheon in the building. This furnished an opportunity to conduct the guests through the shops and carhouse and to explain what is involved in keeping a street railway going. Whenever a new car line is opened, or some other big improvement is completed, some kind of a celebration is staged to commemorate the



N T

Ride the Interurban Lines
to the
Southwestern Exposition
and
Fat Stock Show
MARCH 8-15

Dependable—Safe—Economical
S-E-R-V-I-C-E

Finest Collection of Livestock in the Land—Fascinating Exhibits of
Southwestern Industry and Agriculture
AUTOMOBILE SHOW
SPECTACULAR HORSE SHOW NIGHTLY
(A Society Event)
DOG SHOW, POULTRY SHOW, RABBIT SHOW—MIDWAY ATTRACTIONS
NEW BUILDINGS AND OTHER IMPROVEMENTS
BIGGER—BETTER—DIFFERENT

A Rodeo of Champion Contestants

"You'll Miss It if You Miss It"

"Ride the Street Cars and Save the Difference"

Northern Texas Traction Company
Fort Worth, Texas

T C

This full-page advertisement made a hit in Fort Worth

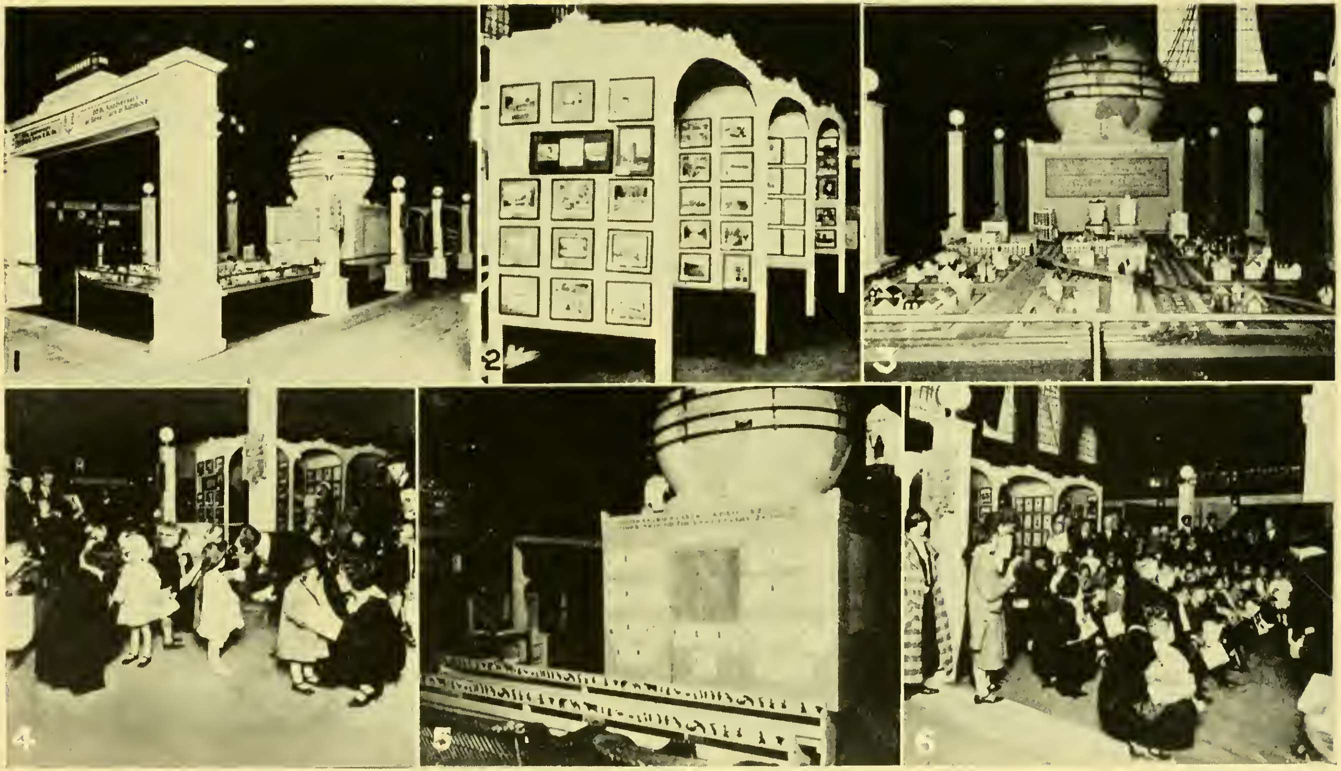
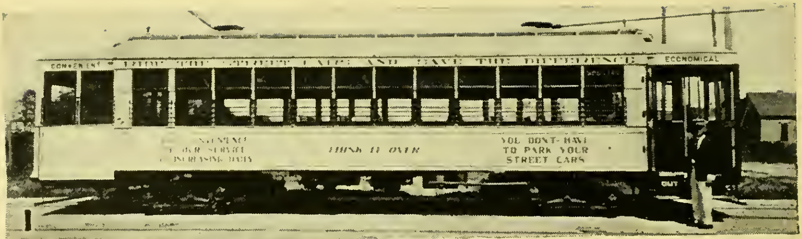
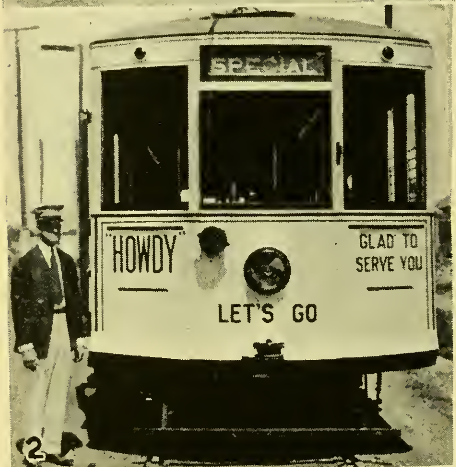
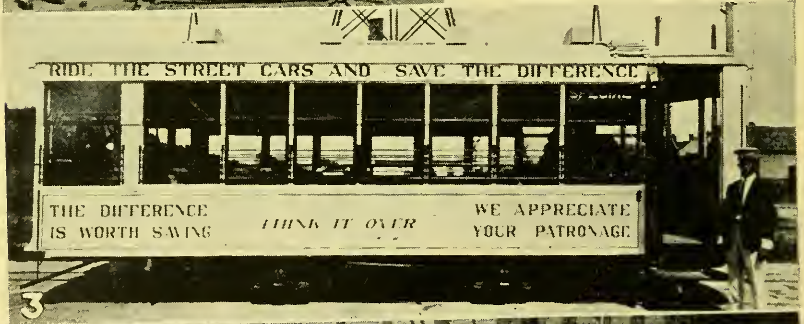


PLATE IX — " *United Railways*" *exhibit at* " *Better Homes Exposition,*" *Baltimore.* (1) *General view.* (2) *Picture gallery.* (3) *Miniature city and globe.* (4) *Pinning safety buttons on children.* (5) " *Kiddies'* " *theatre.* (6) *Children attending illustrated lecture.*





(1) *Double-truck "white car," used in special campaign, Fort Worth.* (2) *Front view, same.* (3) *Single-truck "white car," same campaign.* (4 *Sign on side of special car, Fort Worth.*



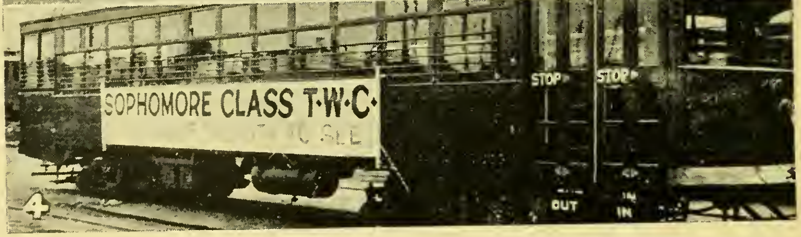


Plate X — *Special advertising schemes, involving the use of cars, employed by the Northern Texas Traction Company*

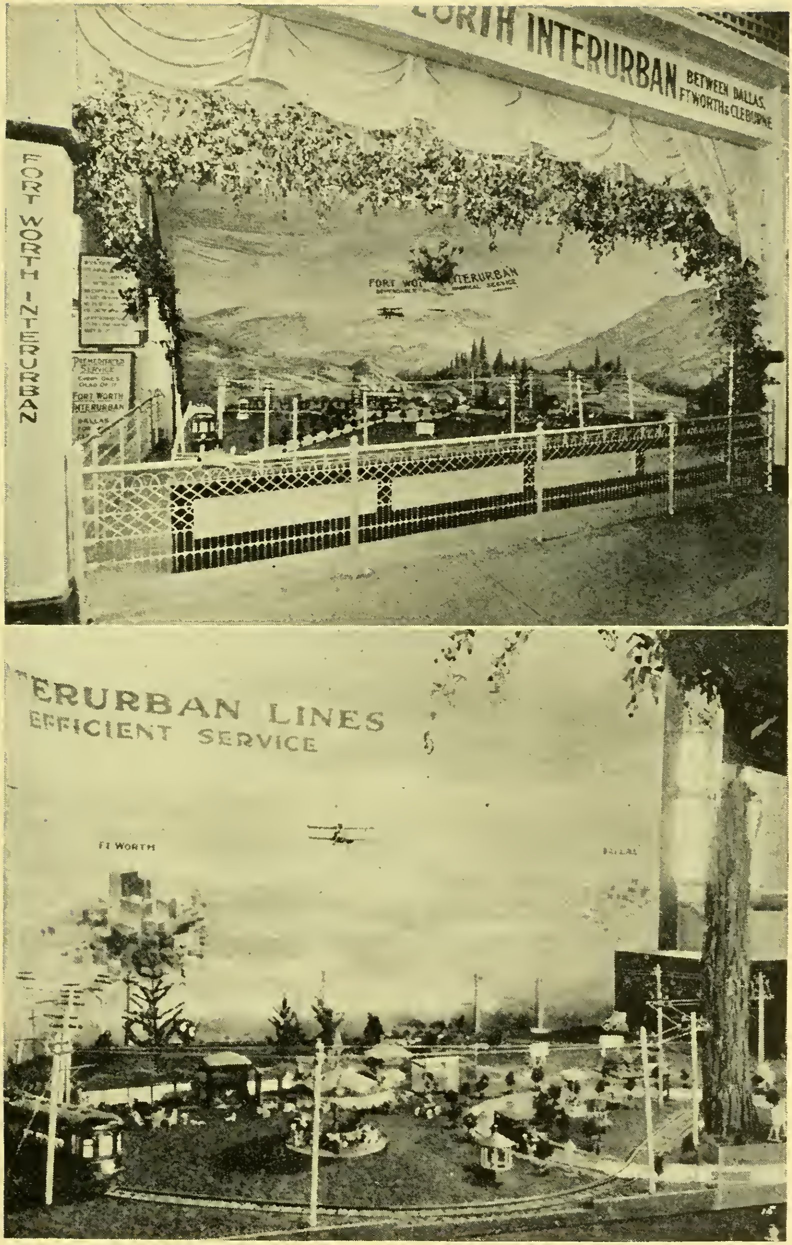


Plate XI — *Exhibits shown at state fairs by Northern Texas Traction Company to advertise service.*

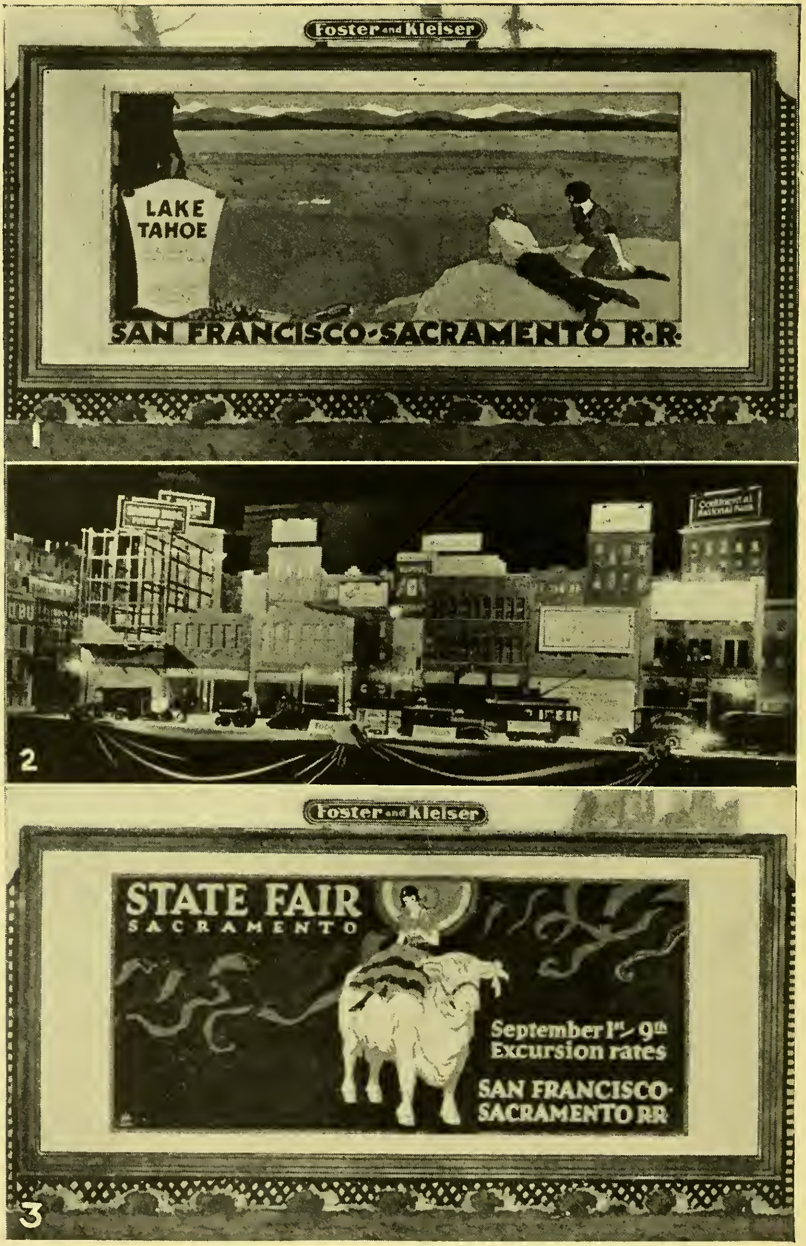


PLATE XII — (1), (3) *Hand-painted billboards, San Francisco-Sacramento Railroad.* (2) *Store-window display, Fort Worth.*

betterment which has thus been made in the service.

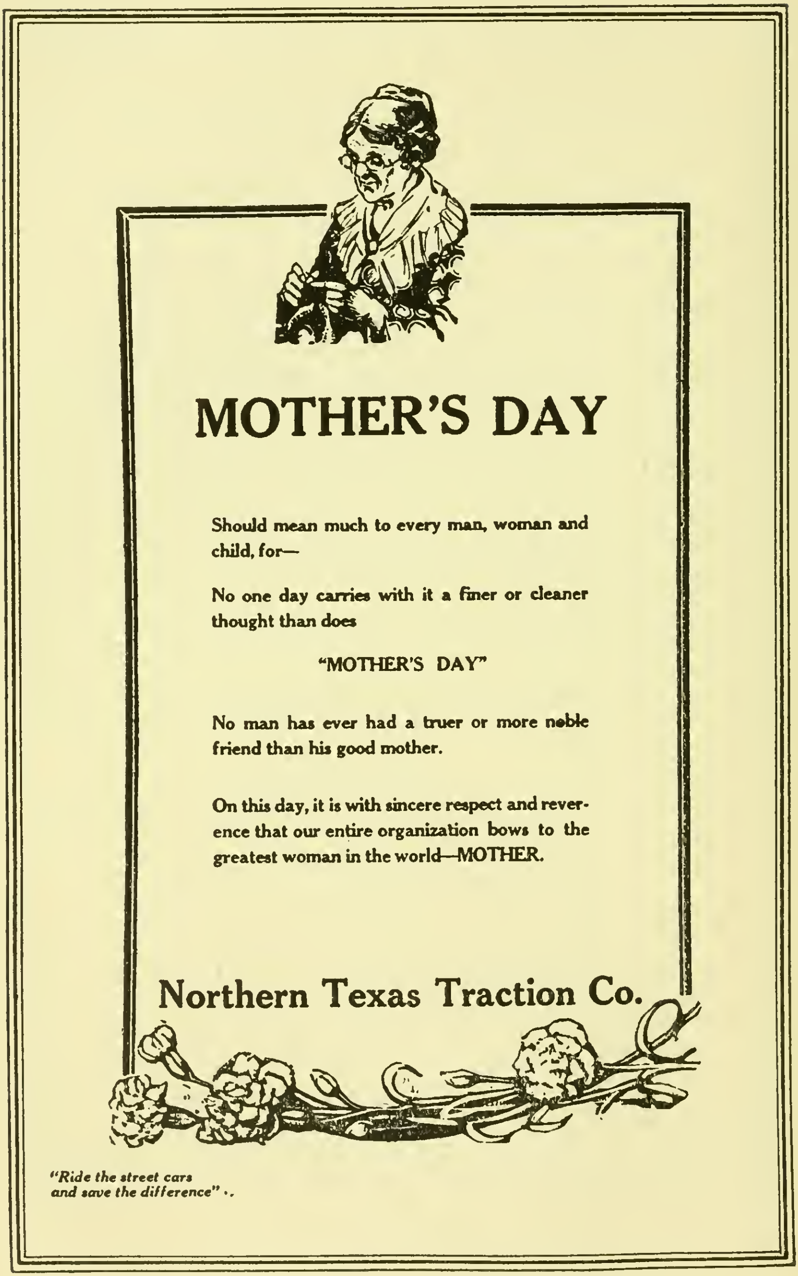
A number of talented employees of this company have been organized into an entertainment team and are available to furnish programs for luncheon clubs, and other organizations. This furnishes an excellent point of contact with the public.

Something of the same sort is an inspection trip over its property which the United Railways & Electric Company has recently arranged, for the purpose of acquainting interested persons with the extent of its facilities. The trip requires several hours and shows the visitors the track, buildings, cars, power plants, etc. In order to make this trip more effective a pamphlet is handed each guest, giving in condensed form a picture of the magnitude of the organization and the service which it performs.

This inspection trip enables the management to get into closer touch with more representatives of the public than it could do in any other way. The booklet is useful, too, for other purposes. Copies are mailed to stockholders, distributed at information booths and otherwise placed in the hands of persons likely to read them carefully.

Unique Exhibits at Fairs

Expositions of various sorts in the territory of an electric railway afford an excellent opportunity for publicity. In Dallas, Tex., a State Fair is held each year which attracts people from all over the State. Many of these travel by way of the Fort Worth-Dallas interurban line of the Northern Texas Traction Company. The railway stimulates business by staging an operating exhibit at the fair.



MOTHER'S DAY

Should mean much to every man, woman and child, for—

No one day carries with it a finer or cleaner thought than does

"MOTHER'S DAY"

No man has ever had a truer or more noble friend than his good mother.

On this day, it is with sincere respect and reverence that our entire organization bows to the greatest woman in the world—MOTHER.

Northern Texas Traction Co.

"Ride the street cars
and save the difference"

Special days can be utilized in railway advertising

At the October, 1923, fair a miniature amusement park was set up on a platform against a background of mountainous scenery. A replica of one of the company's large interurban cars, electrically operated, made the circuit of this park, while an airplane whirred overhead. These active elements attracted the crowds. The same equipment with different set up and background did duty at the "Fat Stock Show and Southwestern Exposition" in Fort Worth in March, 1924.

"Better Homes Exposition"

A notable piece of work in this line was done by the United Railways & Electric Company in Baltimore in connection with a recent "Better Homes Exposition," held by the Real Estate Board of Baltimore in the 5th Regiment Armory. The exhibit occupied a 20 by 60-foot space on the main aisle near the entrance. At the front was a cross span resting on two columns and carrying a 5-foot illuminated model of a "United Railways" car. On the front of the stand were two translucent illuminated panels suitably lettered. A large part of the space was occupied by a miniature city, 15 by 20 feet in size, mounted on a raised platform. The city included suburbs, the built-up residence section and the business district, all connected by electric railway lines on which model cars passed back and forth. This illustrated the legend, appearing on a placard behind the city: "The street car makes every place accessible to your home."

At the center of the space and dominating the exhibit was a huge terrestrial globe, 9 feet in diameter, belted with four tracks on which model cars circulated continually. This illustrated another legend: "The cars of the 'United Railways' run a distance equal to four times around the earth every 24 hours." The globe rested on a rectangular structure of which three of the walls were used for lettered panels. Set in the fourth, on the side away from the miniature city, was a screen on which safety pictures were projected from a lantern inside. On the floor in front of this were benches and chair for "kiddies" and adults. Finally, at the back of the exhibit was a collection of photographs attractively mounted on the walls of a cell-like structure designed to furnish a degree of privacy for examination of the pictures.

Around the exhibit were pylons carrying tablets inscribed, respectively, thus: "Baltimore's horse cars started June 26, 1859." "United Railways formed March 4, 1899." "America's first electric railway was in Baltimore." "United Railways has 415 miles of track." "United Railways carries 950,000 passengers daily." "United Railways employs 5,000 persons." "United Railways pays $7,000,000 in wages annually." "112,000,000 free transfers issued in 1923." "$1,139,000 park tax paid in 1923." "United Railways carries 328,000,000 passengers a year."

For the exhibit the "United Railways" received the first prize, a handsome silver cup.

An Attractive Window Display

In Fort Worth, last spring, an unusual type of advertising was used in connection with the "Forward Fort Worth" movement. In a prominent store window a miniature reproduction of part of the downtown district of the city was displayed. Street cars and other vehicles were carried on a moving belt, giving the model a realistic appearance. This was a co-operative scheme in which the local railway participated. Use was made of the space on the sides of the street cars to push the slogans: "Save the difference" and "Get acquainted with your neighbor." The whole model was brightly illuminated at night and proved a source of great interest during the two-weeks display.

Use of Projection Lanterns

Motion pictures make an excellent advertising medium, especially if arrangements can be made to show them in the local motion-picture houses. This can be done when the pictures have a news character, as was illustrated last year in New Bedford. There, the Union Street Railway had two fine pictures made, one being in celebration of the fiftieth anniversary of the beginning of street railway service in the city. The other was entitled "The evolution of the local street railway system." There was no difficulty in getting these into the local houses.

Closely allied to the motion picture is the automatic steriopticon. This the "United Railways" has used effectively in the store windows of the principal shopping district in Baltimore for pointing out various phases of the transportation situation.

The "Interstate News" Has Large Circulation

Many companies find good advertising value in periodical publications designed to reach the general public. A notable example is the Interstate Public

Service Company, with its "Interstate News," now circulating about 40,000 copies monthly. At the head of the editorial column of the "News" appears the following:

"This paper is devoted to the interests of the Interstate Public Service Company, its patrons and employees, and to creating better business relationship between the utility and the public."

The publication has a mailing list of 8,000, covering all owners of the company's securities, shippers who use the railway and prospective shippers, colleges and universities, public libraries, newspapers, and other individuals and institutions. The railway department distributes the paper through its stations. It is not infrequent to see practically every passenger on the company's trains on the first of the month reading the "Interstate News."

The same editorial policy is followed in the paper as that which governs the preparation of material for the newspapers, and a large amount of material is reprinted from it monthly.

Handpainted Billboards Effective

Much attention was given to the use of billboards in advertising in last year's presentations. This year but two illustrations will be used, these being reproduced in Plate XII.

These are typical of the boards used by the San Francisco-Sacramento Railroad. On this property the boards are handpainted from unusually attractive designs and they are changed monthly. The billboards are 25 feet long and 10 feet high.

The billboards illustrated are painted in brilliant colors. One consists largely of a stretch of ultramarine water with white and purple mountains in the distance. In the other orange and pink banners fly gaily from a rope, while mounted on the back of the huge bull is a young lady in bright yellow costume and wearing an orange-colored cap. Over her shoulder is a blue parasol.

Miscellaneous Advertising

To the man with an eye for advertising opportunities their number is legion. The problem is to know where to stop. A few examples will suffice to indicate some of the smaller devices which have proved effective. The Union Street Railway distributed thousands of paper match folders advertising its parks, as explained elsewhere. The United Railways & Electric Company has used the backs of its transfers for good-will purposes, besides presenting thereon information regarding its resorts, notices of changes in operation and safety messages. Typical legends thus given wide circulation were the following: "January is a bad month for walking. Watch your step." "The Jay Walker. No, it is not a bird or a new-fangled submarine. They apply this title to the person who cuts across streets in the middle of blocks where traffic rules provide — and motormen, drivers and chauffeurs have a right to assume — that there shall be no crosswise traffic. Street corners are the proper and safe places for crossing streets."

The San Francisco-Sacramento Railroad has done much with blotters, which give information regarding trains, particularly emphasizing the fine schedule between the terminal cities. These are sent to Chambers of Commerce, Lions' Clubs, Kiwanis Clubs and other organizations, and are put in all hotels in the territory.

In all of this work the carefully worded slogan can play an important part. "Save the difference" has been mentioned as one which took the public fancy last year in Fort Worth. In that city the 1-man cars were completely "sold" to the public through this and other forms of advertising.

In Baltimore the railway company has found that schools, church clubs and civic bodies are interested in the electric railway story, the telling of which in an interesting manner is one of the best kinds of advertising that can be done. This company also uses its attractive carhouse surroundings for the same purpose. Capital may also be made for advertising purposes of such events as the opening of a new car line as is described in connection with Fort Worth property in Chap IV. It is difficult to draw the line here between advertising and public relations, because the two are very closely related.

CHAPTER IV

Fostering Good Public Relations

GOOD feeling on the part of the public toward the utility which serves it is primarily based on good transportation service. No amount of "palaver" will in the long run convince patrons that they are being well served. However, something more than good service is necessary if the most friendly relations are to be preserved. A few illustrations of what can be done to supplement good service are taken from the "briefs."

First, in the handling of accident claims, always a source of possible ill feeling, there is a real opportunity for making friends for the railway. The officials of the Shreveport Railways feel that they have been able to do this by convincing their patrons of their intention to deal fairly. No claimant is allowed to go away without a complete understanding of all of the facts upon which a conclusion is based.

The same principle applies in the less important matter of adjusting financial differences with patrons. The San Francisco-Sacramento Railroad makes a special feature of this. On this property refunds on unused tickets are handled in two ways. Most of such claims are made at ticket offices, where agents are authorized to make cash adjustments out of current funds. This insures promptness and pleases the claimant. If tickets are mailed to the general office, the claims receive the attention of the auditing department the first thing in the morning and checks are forwarded to the claimants on the same day.

This company handles freight claims with equal dispatch. As to freight overcharges, the waybills which are forwarded daily to the auditor are promptly audited; if the charges assessed and paid are found to be excessive the consignee is requested to call upon the agent for his refund. At the same time a correction notice is sent to the agent authorizing the refund. The only requirement is that the original freight bill be surrendered. In many such cases the shipper is not aware that an overcharge has been made, and, of course, he appreciates the care with which his interests are safeguarded.

Damage Claims Promptly Settled

This company is a party to through freight tariffs, and handles freight traffic from and to points in practically all parts of the country. It is therefore required to settle numerous loss and damage claims. Such settlements sometimes require correspondence with carriers as far away as the Atlantic Coast, to determine the condition of the freight as shipped. To satisfy claimants promptly it is the custom of the company to pay the claims immediately when the legal liability of the carriers has been established. Large claims are paid by voucher through the auditor's office. While the number of joint claims settled by the company is large, its own participation in such claims is small, due to the special care taken in handling freight. During a period in which more than 340,000 tons of freight was handled the charge to loss and damage amounted to but 0.0078 cent per ton.

Service Department Established in Baltimore

The United Railways & Electric Company last year established what it calls a "service department," to promote close relations with the public. An experienced railway man was placed in charge and he advertised in various ways that he wished the co-operation of the railway patrons in improving the service. Constructive suggestions, criticisms and complaints were invited, with a view to adjusting complaints, correcting misunderstandings, giving information to those desiring it and ascertaining the public's attitude toward the railway.

The response to this new plan of the company has been gratifying. Letters, telephone calls and personal visits in large numbers have resulted. Some excellent friends have been made for the railway among people who would not otherwise have been reached.

For the same purpose, but with a different plan, the Interstate Public Service Company has instituted a "women's public information committee." This is to insure on the part of the women employees an ability intelligently to answer questions asked by patrons, and incidentally to impress the importance of courtesy. As a basis for this committee's work the lectures of Dean Heilman of Northwestern University, on public utility problems, are studied at home and discussed at meetings held for the convenience of the employees at different points on the system. The women also prepare and read papers upon electric railway subjects. The chairman of the committee sends weekly bulletins to the members, giving general information regarding the railway.

Attractive Grounds Please the Public

Systematic attention to the appearance of the grounds surrounding electric railway buildings is sure to be appreciated by the public. The Northern Texas Traction Company gave this principle a trial two years ago with such good effect that the work was greatly extended during the past year. The United Railways & Electric Company has tried to provide as many garden spots on the property as possible. To make the present spaces more attractive and to plant new spaces a man has been placed in charge of gardening and given an assistant.

The gardener has a motor truck and all of the necessary gardening tools, and exercises general supervision over the carhouse gardens, seeing that they are properly laid out and maintained in good condition. He directs the efforts of the man on duty at each location so that the best results can be obtained.

To the same end the latter company refuses to grant privileges for the erection of advertising signs on its vacant lots, where such signs are not in keeping with the surroundings, or are objected to by neighbors.

Getting Together on Electrolysis

The electrolysis question is one which can become a source of irritation and hence of difficulty in maintaining good public relations. It is as difficult in Baltimore as in other cities, but has not been allowed to become a bone of contention. The United Railways & Electric Company has participated in the activities of a committee in which the city water and electrical departments, and the other utilities, co-operate under the leadership of the chief engineer of the Public Service Commission. When problems relating to stray currents from the railway circuits arise they are settled around the committee table without resort to lawsuits. From the standpoint of the company the matter is being handled in a businesslike manner.

Participation in Organized Activities

No surer road to public good will can be found than that which leads through the organizations which have been built up around civic and general social needs. Hence it is desirable for electric railway officials and others to participate in the activities of these organizations. This may be done informally, but some kind of a plan is better.

The San Francisco-Sacramento Railroad has had excellent results from the following practice: In the small communities which it serves, the station agents are expected to belong to the local Chamber of Commerce or Merchants' Association and to attend all of the meetings. In one small town at the end of a bus line there is no agent, but the bus driver is the company's civic representative. The company officials are all members of the Chambers of Commerce in San Francisco, Oakland and Sacramento. Some of the connections of the staff of the railway are these: vice-president and general manager, president California Electric Railway

Association, president Pacific Railway Club of California; general agent Sacramento, president Sacramento Development League, member Rotary Club; traveling freight agent Oakland, director Lions' Club; passenger soliciting agent Oakland and San Francisco, vice-president and director One Hundred Per Cent Club.

The Northern Texas Traction Company also testifies as to the benefits accruing from maintaining memberships for its men in local civic and luncheon clubs. Members of the staff make it their business to attend the meetings of these clubs and participate actively in their proceedings.

A questionnaire distributed to the official staff of the United Railways & Electric Company showed that men in this organization hold membership in sixty-nine clubs, and business and civic organizations in Baltimore, aside from many other associations, church clubs, etc. Every opportunity is embraced to have representatives speak before these associations, neighborhood gatherings and other assemblages, to keep the railway situation properly clarified. This company recognizes the importance of good will on the part of the younger generation, and its susceptibility to correct impressions. To furnish such impressions, safety talks, and historical sketches of the railway development and history, are given in the schools and elsewhere. These are frequently illustrated with stereopticon slides.

Helping to Make Civic Events Successful

When any kind of a celebration is under way in a community the promoters usually find the electric railway management ready to lend practical assistance.

Take, for example, the 3-day celebration held in Fort Worth in November, 1923, in commemoration of the 75th anniversary of the founding of the city. This was staged as a " Diamond Jubilee." The local railway company contributed both money and time in such work as having the line crews hang flag decorations on the span wires. Cars were re-routed so as not to have them run on those streets where parades were planned to be held.

One night during the celebration the then national commander of the American Legion made a speech in Dallas and was scheduled to speak in Fort Worth over the radio shortly thereafter. The time allowance was too short for use of the regular interurban service, so the railway placed a special car at the disposal of the commander and his party and brought them to Fort Worth in the record time of 40 minutes (30 miles) in ample time for the broadcasting. This performance gave the company front-page newspaper publicity and pleased the radio " fans."

Co-operation With the Municipality in Baltimore

The United Railways & Electric Company has participated vigorously of late in civic activities in Baltimore. Within a few weeks after the inauguaration of the present Mayor in May, 1923, the company, with other utilities and important business and manufacturing organizations, was asked by the Mayor to loan from its staff some competent person to serve on a special board to make a complete study of the business methods of the municipality and advise the new administration as to reorganization of municipal departments and methods. The company thereupon assigned an expert from its staff, one who was familiar with the details of municipal administration, modern accounting and the legal provisions which restrict municipal administration. After nearly a year's work the board's work was still incomplete, but it had resulted in a complete reorganization of many of the business methods of Baltimore City, with further and more important steps still to be taken. From time to time, the company, with the other organizations represented on the board, loaned the city other employees for advisory purposes in the reorganization.

The company was also requested by the Mayor to supply representation on a committee to devise a solution for the traffic congestion problem. The resulting recommendations with respect to regulation of parking in the central district were, after approval by the Mayor, duly put into effect by the Police Commissioner.

During the past year the Fort Worth Chamber of Commerce decided that the city needed more industries. The manager of the Northern Texas Traction Company, therefore, with other prominent citizens, succeeded in securing the location of a cotton mill contingent upon the residents of the city taking a substantial block of the stock of the company. Following its general policy, the railway company made a cash subscription of $10,000 for stock. The mill construction was promptly started.

Free Advertising for Worthy Enterprises

The very great advertising value of the space in street cars is being used to build good will through its use for giving publicity to philanthropic and other civic enterprises. The number of such that can be helped is large, as is illustrated by one year's experience of the United Railways & Electric Company. It carried, gratis, advertising matter for the following: American Red Cross ("Help Japan"); Baltimore Safety Council ("Fire Prevention"); West Baltimore General Hospital (campaign for funds); Travelers' Aid Society (campaign for funds); Near East Relief ("Bundle Day"); American Red Cross (campaign for funds); Maryland Tuberculosis Association (campaign for funds); Public Schools ("Educational Week"); Friends of Art (art exhibit); Baltimore Poultry Association (poultry show); Young Women's Christian Association (membership drive); Federation of Labor ("Labor Circus"); Baltimore Alliance of Charitable Agencies (campaign for funds); Children's Hospital School (benefit); Catholic Society ("Passion Play"); Maryland State Board of Forestry (forest protection); Associated Jewish Charities (campaign for funds); Real Estate Board ("Better Homes Exposition"); Civic Committee ("Clean Up and Beautify Week"); Baltimore County Children's Aid Society ("Military Carnival"); Citizens' Military Camp (enlistment campaign). Such service cannot but be appreciated by a community.

Co-operation With American Legion

The Northern Texas Traction Company recently had an opportunity to cement its good relations with the public by building a small freight car for a local organization of the American Legion. With the main body of the Legion there is what is known as "La Société des 40 Hommes et 8 Cheveux." This name comes from the capacity marking on the small French freight cars in which the soldiers were carried when members of the American Expeditionary Force.

The members of the local section of this association, the "Voiture Locale," asked the railway company to build in its shops a replica of one of these cars which could be hauled on the street-car tracks during parades, initiations, etc. The company donated the truck and furnished the body for the ex-soldiers at cost. It supplies a motor car and motorman free and hauls the freight car on its tracks whenever it is to be exhibited. The railway receives full credit for its part in this enterprise.

Fire Apparatus Placed at Disposal of Village

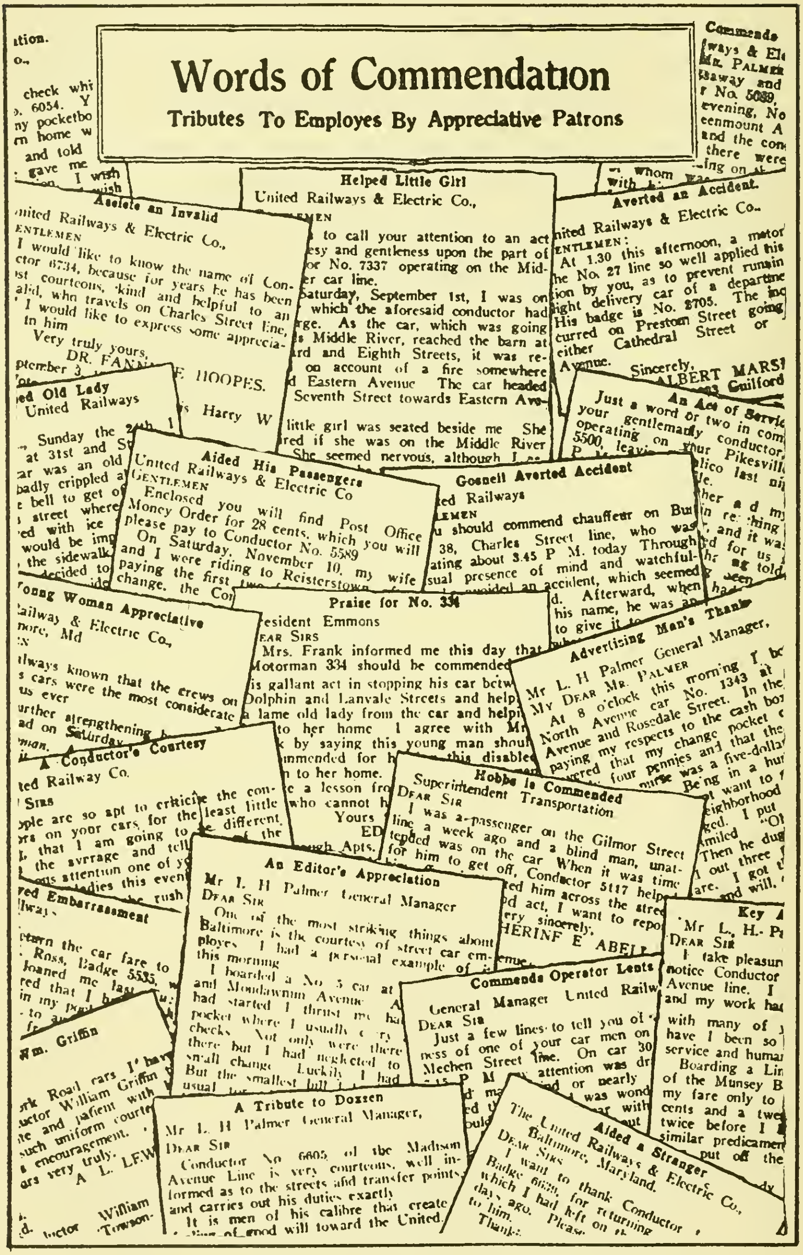
The good feeling of one community on the Northern Texas Traction Company's lines has been intensified through the making available to the Village of Handley of the company's local fire-fighting apparatus. The railway power generating station and interurban carhouse are located in this village, which has no fire-fighting equipment, whereas the railway is fully equipped. The apparatus has been placed at the disposal of the village, and has been called into action on several occasions. A quarter-mile hose line has been laid by the railway employees and fires extinguished which if not checked might have swept the entire village. This is entirely gratuitous because the isolated position of the railway property renders it immune from the effect of village fires.

A growing suburb of Fort Worth is known as "Riverside." It needed transportation service. During 1923 the Northern Texas Traction Company constructed a car line to connect the business section of the city with the suburb. Temporary service was given with White buses, operated on a 10-minute headway. The fare was the same as on the street cars and transfer between buses and cars was free. The daily receipts were $50. On Jan. 24, 1924, the new car line was opened, giving 12-minute service, with an immediate and sustained increase in revenue to $110.

The new service furnished opportunity for excellent publicity. The "Fort Worth Record" considered the occasion important enough for a special "Riverside Supplement," featuring the suburb and especially the car service. In this the railway advertised liberally. A special car took prominent citizens to Riverside, where hundreds of citizens met them and through representatives conveyed their appreciation of the new service. The "parent-teachers" association served refreshments, and flowers were presented to the company officials. Thus was received the service which immediately attracted more than 100 per cent increase in business.

Good Will Takes Tangible Form

The test of good public relations comes when it is necessary to make some concession to the public utility. There is ample evidence of this sort in the 1924 presentations. The Aurora, Elgin & Fox River Electric Company has had several pleasant experiences recently. In Aurora, the terms of the former franchise, which was to expire in 1929, were so burdensome that the City Council had to be informed that operation could not continue under them. At the same time the company stated that if it could be relieved of these burdens it would



Words of Commendation

Tributes To Employes By Appreciative Patrons

check whi
. 6054. Y
ny pocketbo
m home w
and told
gave me
I wish

Assists an Invalid

nited Railways & Electric Co.,
ENTLEMEN
I would like to know the name of Con-
ctor 6734, because for years he has been
st courteous, kind and helpful to an
alid, who travels on Charles Street line,
I would like to express some apprecia-
to him
Very truly yours,
DR. FANN E HOOPES.
ptember 3

Helped Little Girl

United Railways & Electric Co.,
MEN
to call your attention to an act
esy and gentleness upon the part of
or No. 7337 operating on the Mid-
er car line.
Saturday, September 1st, I was on
which the aforesaid conductor had
rge. As the car, which was going
s Middle River, reached the barn at
rd and Eighth Streets, it was re-
on account of a fire somewhere
d Eastern Avenue The car headed
Seventh Street towards Eastern Ave-
little girl was seated beside me She
red if she was on the Middle River
She seemed nervous, although I

Commends

ways & Ele
MR. PALMER
away and
r No. 5089,
evening, No
eenmount A
and the con
there were
ing on
Whom
With

Averted an Accident.

nited Railways & Electric Co.
ENTLEMEN:
At 1.30 this afternoon, a motor
he No. 27 line so well applied his
ion by you, as to prevent runnin
ight delivery car of a departme
His badge is No. 8705. The inc
curred on Preston Street going
either Cathedral Street or
Avenue.
Sincerely,
ALBERT MARS
Guilford

ed Old Lady

United Railways
s Harry W
Sunday the
at 31st and St
ar was an old
badly crippled a
e bell to get o
street where
ed with ice
would be imp
, the sidewalk
decided to

Aided His Passengers

United Railways & Electric Co
GENTLEMEN
Enclosed you will find Post Office
Money Order for 28 cents, which you will
please pay to Conductor No. 5589
On Saturday, November 10, my wife
and I were riding to Reisterstown
paying the first
change, the Co

An Act of Service

Just a word or two in com
your gentlemanly conductor,
operating on your Pikesvill
5500, leav
lico last ni
le.
her and my
in re hing
, and it wa
d for us
ng told

Gosnell Averted Accident

ed Railways
LEMEN
u should commend chauffeur on Bu
38, Charles Street line, who was
ating about 3.45 P M. today Through
sual presence of mind and watchful-
avoided an accident, which seemed
d. Afterward, when
his name, he was a
to give it to

Young Woman Appreciative

ailway & Electric Co.,
more, Md
always known that the crews on
s cars were the most considerate
us ever
urther strengthening
ad on Saturday
man.

Praise for No. 334

esident Emmons
EAR SIRS
Mrs. Frank informed me this day that
Motorman 334 should be commended
is gallant act in stopping his car betw
Dolphin and Lanvale Streets and help
a lame old lady from the car and helpi
to her home I agree with Mr
by saying this young man shou
mmended for h this disable
to her home.
a lesson fro
who cannot h
Yours
ED
gh Apts.

Advertising Man's Thanks

Mr L. H Palmer General Manager,
MY DEAR MR. PALMER
At 8 o'clock this morning I bo
North Avenue car No. 1343 at
Avenue and Rosedale Street. In the
paying my respects to the cash box
ered that my change pocket c
four pennies and that the
purse was a five-dolla
Being in a hu
want to
eighborhood
ged. I put
miled "Oh
Then he dug
out three
are. I got
and will.

A Conductor's Courtesy

ted Railway Co.
SIRS
ople are so apt to criticize the con-
ors on your cars for the least little
, that I am going to different.
, the average and tell the
attention one of y
ladies this event
rush

Hobbs Is Commended

Superintendent Transportation
DEAR SIR
I was a passenger on the Gilmor Street
line a week ago and a blind man, unat-
tended was on the car When it was time
for him to get off, Conductor 5117 help
ed him across the stree
d act, I want to repo
ery sincerely,
HERINE E ABELL

ved Embarrassment

ways.
turn the car fare to
Ross, Badge 5535,
loaned me las
red that I h
in my po
to a

An Editor's Appreciation

Mr L. H Palmer General Manager
DEAR SIR
One of the most striking things about
Baltimore is the courtesy of street car em-
ployes. I had a personal example of it
this morning
I boarded a No 5 car at
and Mondawmin Avenue A
had started I thrust my ha
pocket where I usually carry
checks Not only were there
there but I had neglected to
small change Luckily I had
But the smallest bill I
usual

Key

Mr L. H. Pa
DEAR SIR
I take pleasur
notice Conductor
Avenue line. I
and my work ha
with many of
have I been so
service and huma
Boarding a Lin
of the Munsey B
my fare only to
cents and a twe
twice before I
similar predicame
put off the
dy

Wm. Griffin

rk Road cars I have
uctor William Griffin
te and patient with
such uniform courte
s encouragement.
ers very truly.
A L. LEW

William
Towson
uctor

Commends Operator Lents

General Manager United Railw
DEAR SIR
Just a few lines to tell you of
ness of one of your car men on
Mechen Street line. On car 30
15 P M attention was dr
d or nearly
was wond
with
out

A Tribute to Dossen

Mr L. H Palmer General Manager,
DEAR SIR
Conductor No 6605 of the Madison
Avenue Line is very courteous, well in-
formed as to the streets and transfer points
and carries out his duties exactly
and carries out his duties exactly
It is men of his calibre that create
feeling of good will toward the United.

Aided a Stranger

The United Railways & Electric Co.,
Baltimore, Maryland.
DEAR SIRS
I want to thank Conductor
Badge 6639, for returning
which I had left on the
days ago. Please
to him.
Thanks

Clippings from company publication show appreciation provide new equipment, improve service and reduce fares. After the subject had been fully discussed in public meetings, an ordinance was passed relieving the railway of all payments into the city treasury and from all future paving obligations. This was then submitted to popular vote and without a campaign on the part of the company was approved by a seven-to-one vote.

A somewhat similar situation existed in Elgin, where the franchise had actually expired. There the company was relieved of paving burdens for ten years. In Batavia, where new paving had been laid, the railway's share of the cost was cut in half and it was excused from making franchise payments, although required to do so under its franchise.

This company also secured ordinances from five municipalities permitting the construction and operation of 33,000-volt transmission line.

The San Franciso-Sacramento Railroad has had many evidences of good will in the way in which it has been protected from competition. In all cases where applications for "certificates of necessity and convenience" have been filed by proposed competing bus lines, they have been denied by the State of California Railroad Commission, after hearings had been held by it. Chambers of Commerce, Business Men's Associations, Farm Bureaus and Improvement Clubs have passed resolutions and forwarded them to the Commission, asking for the denial of the applications.

Testimonials to Good Service

In the summer of 1924 the Northern Texas Traction Company had occasion to canvass its interurban patrons to secure information regarding the distribution of their residences. At the same time they were asked to make anonymous suggestions or criticisms regarding the service. Out of 1134 passengers canvassed, only 9 per cent criticised the service, and that on minor features. Most of the causes of complaint were beyond the control of the company. The others praised the service, in some cases suggesting improvements.

A typical letter of appreciation was received by the Charles H. Coffin prize committee of the American Electric Railway Association regarding the Shreveport Railways. It came from a local attorney, connected with the railway neither financially nor professionally. He wrote, in part:

> Since Captain Hearn become president of the Shreveport Railways Company, it has gained so steadily in public good will that I believe it to be today the best liked of the public service corporations of this city. Not only is it true, in my opinion, that the public on the whole entertains a great deal of good will toward the Shreveport Railways Company, but there has been a noticeable change in the attitude and feeling of the employees of the company toward it.

Few Complaints in Baltimore

The relatively satisfactory character of the transportation service furnished the people of Baltimore as compared with that of other utilities is reflected in the small number of complaints lodged with the state public service commission. In 1923, according to a statement of the commission, 418 complaints were filed against the telephone company, 176 against the lighting company, and 66 against the " United Railways." Thus there were, on the average, 5½ complaints per month, which was one for about 5,000,000 passengers carried.

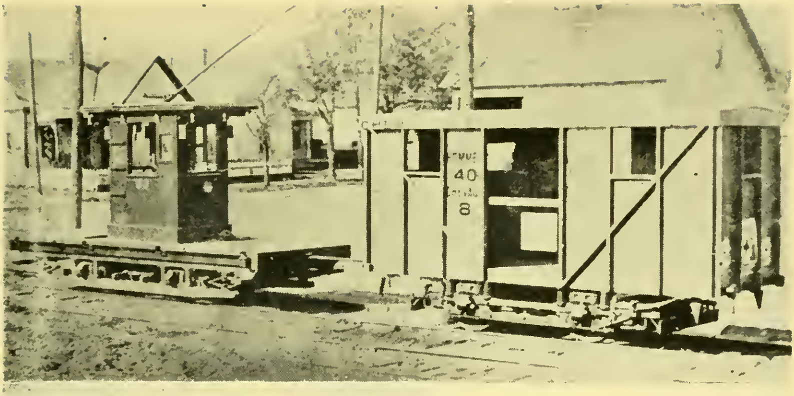
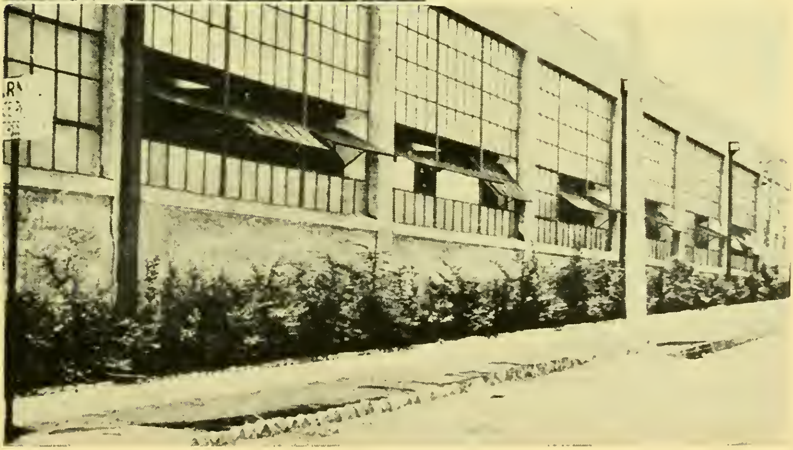


Plate XIII—(Above) *Replica of French box car, Fort Worth.* (At left) *Part of gathering to celebrate opening of new line to Riverside, Northern Texas Traction Company.* (Below) *Plants along shop wall, Fort Worth.*



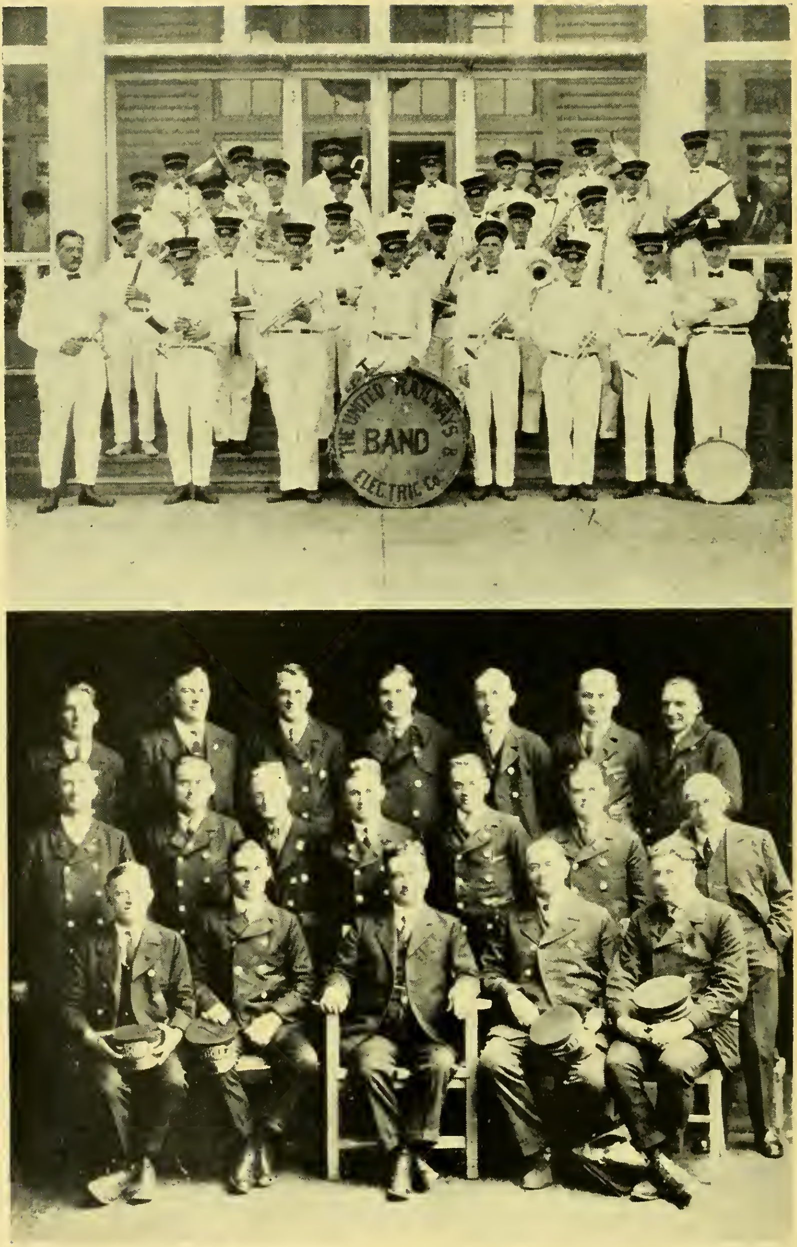

THE UNITED RAILWAYS & ELECTRIC CO.
BAND

Plate XIV — (Above) *The " United Railways " band, Baltimore.* (Below) *Glee club, same.*

CHAPTER V

Relations Between Management and Employees

UNDER normal conditions the electric railway employee likes his job. It is more attractive than many lines of work partly because, on a well-managed road, there are numerous compensations for the worker in addition to the wages. The management, directly or indirectly, provides many benefits with a view to relieving the employee of worry and thus enables him to give more reliable service. The modern way of providing these benefits is through an employees' association of some sort. A few examples from this year's presentation will be given.

Employees' Association in Baltimore

Employees of the United Railways & Electric Company in Baltimore are organized as the "United Railways Association," with an executive body, or general committee, elected by ballot annually. The general committee comprises the officers and approximately thirty representatives from all parts of the property. The general manager, assistant to the president and superintendent of transportation attend its meetings, which are held twice monthly.

At these meetings, suggestions, complaints and requests are presented to the management by the representatives of the employees.

They are discussed by the representatives of the management, who either dispose, at the time, of questions raised or agree to report upon them at the next meeting. If possible, conditions complained of are made satisfactory promptly or reasons why they cannot be made so are given.

As a vehicle for "collective bargaining" between men and management the association has been signally successful.

General Welfare Work Included

The association has gradually broadened its work, so that today the privileges of membership include family death benefits; free service of doctors, surgeons, dentists and nurses, and free treatment in hospitals. Through an affiliated building association, funds are advanced for home buying or building. Arrangements have also been made with the railway company for easy payments on fuel purchases and on new uniforms.

In sixty-seven months, to July 1, 1924, over 69,000 visits were made by employees to doctors' offices, and more than 24,000 by doctors to homes, involving treatment of 40,500 individuals. About 2,280 persons received surgical treatment. Over 6,000 persons were given dental treatment, visiting the dental offices 20,000 times for this purpose. The work of the nurses, and of the eye, nose and ear specialist was equally notable.

In this period $374,000 was paid to the members in sick benefits, hospital expenses, etc., covering which membership dues provided $290,000 and the company contributed $95,000. Life insurance, pensions, lunch rooms, food depot, etc., were paid for by the company to the extent of over $450,000.

How the Activities Are Organized

The executive officer of the United Railways Association is its secretary, and he is also secretary of a "welfare board." He bears the title "Supervisor of co-operation and employment," and is in constant touch with all employees needing his services. The doctors, dentists and nurses, working through the association, are under his direction.

Daily reports are made to the secretary of sickness of employees or their families. Employees in financial or legal difficulties may secure through him the necessary aid to tide them over emergencies. The supervisor also handles details of picnics, dinners and other gatherings of employees.

Two items mentioned above are worthy of additional detail. First, the building association, an outgrowth of the United Railways Association, was organized Sept. 1, 1920. In less than forty-eight months it loaned over $430,000 to 198 employees who were purchasing homes. On July 1, 1924, $280,700 was out on loan to 165 employees; the membership was 1280, and the amount on deposit was $235,000. The other item was the fuel purchases. During the winter season of 1923–24, the railway financed the purchase of 5,250 tons of coal on 1922 orders, paying for it on delivery and permitting the purchasers to reimburse the company in small installments.

The "Employees' Association" of the Union Street Railway, while organized in 1917, plays an important part in the present success of the railway. It is financed by the payment of 30 cents per month by the members and the same amount per member by the company. The association provides a means for adjustment of differences with the company through its "conference committee." The association, through its entertainment committee, provides a large variety of social activities, such as an annual Christmas tree party, "Kiddies' Day," card parties and dances. An eight-team bowling league is a feature of permanent interest.

The employees' magazine on this property, "Trolleygrams," is purely an employee production, being edited and managed by two platform men. The balance of the staff is made up of departmental employees. While the company finances the magazine, it does not interfere in the control and only a small part of the space is occupied with company articles. Most of the material is contributed by the employees, who regard the publication as their own and take great interest in it.

An Employees' Aid Society

The welfare work of the Northern Texas Traction Company is handled through the "Employees' Aid Society," organized originally to provide aid in case of illness or debt. From time to time the scope and benefits of this association have been changed to meet the needs of the employees. Beginning with January, 1924, the allowances were increased to the following:

For the first 120 days of sickness $2 per day is paid, and $1 per day for the following 60 days, a maximum of $300 for one illness. Complete medical attendance is provided, including services in case of major operations, and the services of an eye, ear and throat specialist. A hospital allowance of $15 per week is made whenever the association physician considers it necessary to send the patient to the hospital. The cost of medicines is also an association charge. In case of death $500 is paid to the heirs if the employee has been in service less than six months and $1000 for longer service.

For all of the above, the employee pays $1 per month and the company a like amount. Membership is compulsory with all white, permanent employees.

Beginning with January, 1924, the Aid Society offered its members the privilege of a complete physical examination annually, and encouraged them to take advantage of this, although there was no compulsion. More than 90 per cent did so. The results have been gratifying to the members in disclosing conditions which can be rectified and which otherwise might have caused serious illness and even death.

Arrangements have also been made for employees to increase their insurance under the group plan, at the rate of 70 cents per month per $1,000. Eighty-five per cent have taken out extra insurance under this provision, the amount allowable being determined by conditions outlined by the insurance company.

Other Co-operative Plans

In addition to systematic organizations like employees' associations, various other expedients are available to facilitate co-operation between men and management.

In Charleston excellent results have been secured recently through closer co-operation with the "grievance committee" of the union local. Formerly the committee called on the management only when a complaint was to be made. Now meetings are arranged at least once a month, at which operating policies are frankly discussed and suggestions invited on matters pertaining to the welfare of the railway. With the co-operation of the union the discipline has been greatly improved, the "grievance committee" taking the initiative in warning offenders of the results of infractions of the rules.

The union officials are called into consultation regularly by the Memphis Street Railway, together with those of the transportation and claims departments, with a view primarily to promoting safe operation. However, this co-operation necessarily results in increased friendliness between the men and the management, through their working together to produce a result from which all benefit. The fact is that the administration of discipline has become much easier and more satisfactory since this special safety program has been under way.

The management of the United Railways & Electric Company makes much of dinners in connection with the promotion of good relations with employees. For example, early in 1924 the president, general manager and other executives met at dinner the superintendent of transportation and his staff for the purpose of promoting a closer co-operation. This was followed by a dinner given by the general manager to the members of the car maintenance forces of the two carhouses having the best record for the preceding year in reducing pull-ins. A dinner is given every four months to the outgoing safety committee, comprising more than a hundred men. The largest recent function of this sort was a dinner at which the " 25-year Club " was inaugurated, involving upwards of 300 employees.

The results of continued close co-operation between men and management on a utility property are seen most clearly in cases of adjustment of difference of opinion or the lack of necessity for such adjustment. In Fort Worth, for example, there has never been a serious difference of opinion. During the past twenty years the same situation has existed in New Bedford, and it has been markedly better since an employees' association was formed eight years ago. The San Francisco-Sacramento Railroad has never had a strike of its employees, due, first, to careful selection of men, and second, to the use of every reasonable effort to keep employees satisfied by frank conference on all matters affecting wages and working conditions.

Insurance and Pension Plans Promote Good Relations

Group life insurance is one of the factors of good relations with employees on many properties. Several examples were contained in the 1923 " briefs." One of the recent companies to take up group insurance is the Interstate Public Service Company. Employees in service for a year or more are entitled to receive a policy for $600. The amount is increased $100 a year to a maximum of $1000. An additional feature is the privilege granted the employees of taking out more insurance at an attractive rate. At first this was limited to the amount of the company policy. A majority of them took the full amount. In March, 1924, the allowance of extra insurance was increased for employees receiving $2,500 or more to an amount equal to their salaries, up to $7,000. Every one eligible subscribed for the full amount.

A pension system for employees has been instituted by the "United Railways" in Baltimore. A person reaching 70 years is pensioned whether disabled or not, and one reaching 65 years, if disabled. Any person in the company's service for thirty years or who is disabled after twenty years is eligible for a pension. The pension is $30 plus $1 per month for each year of service above twenty-five years. For those in service 45 years or more the pension is $50. Eighty-five pensioners are drawing about $35,000 per year.

Insurance payments are also made upon the death of employees. The policies provide for three classes: (a) Those not married but having dependents; (b) married employees having no children, and widows or widowers having children; (c) married employees with children. The face of the policy varies with length of service.

Annuity Plan in Indianapolis

On Jan. 1, 1924, the Interstate Public Service Company put into effect a "service annuity plan" under which men employees reaching the age of 65 years and women, 60 years, are entitled to retire upon an annuity. This amounts to 2 per cent of the average salary received during the period of continuous service multiplied by the number of years in the service. Employees normally retire at these ages unless the directors find special reasons for continuing them in active service.

The plan is administered by five trustees, two elected by the employees. Annuity payments are made monthly. On April 1, 1924, five employees, of ages ranging from 66 to 77 years and terms of service from 20 to 37 years, were placed on the annuity roll.

During the past year the Union Street Railway revised its insurance and pension program. An employee is now insured under the group plan for $250, immediately upon employment. The amount of insurance reaches a maximum after six years of employment. The present status of the group policies on this property is as follows:

Term of employment	Number of policies	Amount of each policy	Percentage of total
Less than one year	41	$250	7.8
One to two years	61	250	11.7
Two to three years	37	350	7.0
Three to four years	47	450	9.0
Four to five years	41	550	7.8
Five to six years	35	750	6.7
Over six years	260	1,000	50.0

The pension scale has been adjusted to take care of the increased cost of living since it was established in 1910.

Better Facilities for Work

Employees appreciate the desire on the part of the management of an electric railway property to supply them with the best possible facilities for their work. This was illustrated in Fort Worth last year in the East Front shops where two excellent wash rooms were installed. These are of reinforced concrete construction, with all plumbing fixtures of white enamel. The interiors are painted white. The fittings include shower baths, and all basins and baths are supplied with hot and cold water. Rattan-covered benches as a convenience in dressing, and individual lockers, are also provided.

Special attention is given to keeping these wash rooms neat and clean. They are washed and swept out daily, and the lockers are frequently inspected to prevent the accumulation of old clothes, etc.

The United Railways & Electric Company has given much attention to this matter of employee facilities. At many points on the system, where the headquarters of large number of men are located, lunch rooms have been established. At these and other gathering places, game tables, reading matter and writing materials are provided. Wherever possible, bowling alleys and pool tables are furnished also. In practically all of the large carhouses there are dormitories with clean, comfortable beds, good toilet facilities, sanitary drinking fountains, etc.

Recognition of Faithful Service

There is an increasing tendency to show in some tangible way that the management of an electric railway appreciates good and long service. The formation of the "25-year Club" by the United Railways & Electric Company is one of the conspicuous examples of this occurring during the past year. A remarkable dinner meeting of employees of this company was held on April 23, 1924, when 331 of them were initiated into the club. Eight of these had served for more than 50 years. Gold buttons were presented to the members, and the men who had served a half-century were especially favored by being seated at the speakers' table with the Mayor of Baltimore, and the president and other officials of the company.

Such recognition by an employer cannot but result in improved *esprit de corps*, impressing as it does the permanency of employment for those who are faithful to their duties.

Insignia for the Sleeve

Another form of recognition of service is the authorization to wear some form of service insignia. A new form of insignia has been adopted by the Union Street Railway for trainmen and inspectors in the form of a vertical gold bar, $\frac{3}{4}$ inch long and $\frac{1}{4}$ inch wide, to be sewed on the bottom of the sleeve. This is awarded for five years service. It takes the place of the usual gold or silver diagonal stripe, and in the opinion of the men who suggested the change it is more impressive. They borrowed the idea from the local police and fire departments. The bar is lettered " U S Ry Co."

Providing Educational Facilities

A sure sign of progressiveness nowadays is seen in the interest taken in educational work. This appears in many forms but has the fundamental purpose of keeping employees alert. The Interstate Public Service Company has in operation a comprehensive educational program, including reading and study courses and a practical course in public speaking. Forty group meetings were held during the past year for discussion of the public relations program. Recently a library was established in the company's main office, with a foundation of 150 books contributed by a stockholder. A " women's public information group " has also been established, more thoroughly to instruct its members regarding the electric railway business as a whole and the operation of the

"Interstate" in particular, and to create a better fellowship and closer understanding among them. The group meets every two weeks.

Developments Along Educational Lines

In Baltimore the "United Railways" has taken advantage of the proximity of the Johns Hopkins University to arrange with the authorities of that institution to provide a university extension course for its employees. The company assists the latter in financing their studies. It also aids other employees who are taking self-betterment courses. The latest educational development is in taking the lead in helping the sons of employees to obtain an education at the University.

The Northern Texas Traction Company was a pioneer in the field of vocational education among electric railways. An account of some of its activities was presented in "Electric Railway Practices in 1923." In 1924 the employees to the number of 112 were taking educational work, an increase over the preceding year, and about 16 per cent of the total number of employees. Last year the work of an electrical shop class was mentioned, the work being based upon text prepared by the International Correspondence Schools. Since then there have been three such courses in operation with excellent results. Educational work has become a permanent part of the activities of the company.

The company long ago saw the benefits which were to be gained by the people of Fort Worth from the appointment of a full-time director of vocational education to direct the work in the city. In conjunction with other industries this was finally accomplished and, beginning

Jan. 1, 1924, a director has been serving under the Fort Worth Board of Education. He is head of the " Division of Vocational Education " of the Fort Worth Public Schools.

The following letter from the director to the management of the Traction Company is a tribute to the work which the latter has been doing:

> This letter is written to commend you upon the excellent results that have been obtained through the vocational classes that have been conducted for your firm during the past three years.
>
> You having been one of the first to take advantage of the vocational educational plans, I wish to congratulate you upon the follow-up that has been accomplished and to assure you that your successful classes and widespread enthusiasm have contributed greatly to the growth of vocational education in Fort Worth; leading to the appointment of a vocational director on a full-time basis.
>
> I trust that we may be of further useful service to you.
>
> Sincerely yours,
> SCOTT J. MCGINNIS,
> *Director of Vocational Education.*

Trainmen's Meetings Held by Lines

Meetings of groups for the discussion of operating practice are educational in nature. To illustrate: An excellent reputation for courtesy is borne by trainmen of the Northern Texas Traction Company. Credit for this must, in part, be given to the practice of holding general meetings for the discussion of courtesy and kindred topics. However, these general meetings were so large that the discussions necessarily were of wide scope. A recent improvement in the practice is the holding of meetings by lines, in charge of the respective line inspectors. This accomplishes two purposes; as all of the men face the same operating conditions the discussion can be specific, and it emphasizes the company policy of considering each inspector as though he were the independent manager of his line.

Recognition for Special Courtesy

A live question with the electric railway manager is how to impress upon his employees the essentiality of courtesy without seeming to " preach " to them. One way is to bring to attention the compliments which are received from patrons. This is done by many companies through their regular publication. In Baltimore a public-minded citizen presents each year to the most courteous employee of the " United Railways " a prize of $50. It was won in 1924 by a woman conductor. This company makes a speciality of impressing upon its car men the importance of favorable relations with the public, pointing out that each is a publicity agent for the railway. On this property a typical instruction to the men is that they shall signal other vehicles to proceed when a car is approaching a crossing at which it is to stop, near-side stops being standard in the city. In Baltimore the street car has the right of way over other vehicles, and careful operators of the latter, when approaching street intersections, appreciate such signals.

Closely allied to the educational work, and a courtesy much appreciated last year by " United Railways " men of the foreman class, including all of those directly in charge of men, was the gift from President Emmons of Sherman Rogers' booklet " Foremen — Spark Plugs or Grounded Wires." This is a reprint in cloth-bound form of addresses before the foremen's school of the Milwaukee Association of Commerce. With each booklet went a personal letter from the president, commending it to the attention of the recipient.

"Trolley Topics" a Human Interest Publication

Logically related to an educational program is the employees' magazine, the railway " house organ." An excellent example is found on the Baltimore property. There is no surer way to catch the spirit of the relations between the " United Railways " and its men than to read the company's monthly publication for employees, " Baltimore Trolley Topics." It is a home magazine, full of readable information about the men and women of the company and their families. It is printed on fine " coated " paper, well illustrated and sufficiently capacious to accommodate all the company and family news, a funny page," Giggles," and a little general information about the electric railway industry. " Trolley Topics " is an important factor in encouraging employees to own their own homes. It pictures many owned homes and boosts the building association which facilitates home ownership.

" Trolley Topics " is about 8¾ by 11½ inches in size, and runs usually from twenty to twenty-four pages. It is distributed free to all employees and goes also to publicity men of electric railways in other cities.

Prominent in " Trolley Topics " and elsewhere on the " United Railways " property is a mythical person known as "Aunt Ellen." She is particularly the friend of the employees' children. No child has yet met "Aunt

Ellen," in fact, she is purely a creature of the imagination somewhat similar to Santa Claus.

Every baby born into the " United " family — officials and employees — is presented with a rattle by "Aunt Ellen." Christmas cards are sent out by her, and she presents the children with books and carries on a voluminous correspondence with them.

Evidences That Men Like Their Work

There are two especially tangible ways in which employees show their appreciation of employment with an electric railway. One is by keeping their jobs a long time, the other is by purchasing stock when they get an opportunity. Thus out of 170 men in the train service of the Interstate Public Service Company, sixty-one have been in continuous service for more than 10 years, including two of more than 36 years' service. Many are stockholders and make excellent stock salesmen. The " Charleston Consolidated," from July, 1923, to July, 1924, had a labor turnover among the platform men of only 6.5 per cent. At the same time the men asked for the opportunity to buy stock. This the company purchased and re-sold to them on the installment plan. The Shreveport Railways during the same period dismissed only three out of 130 platform men. In the first seven months after the Aurora, Elgin & Fox River Electric Company was taken over by the Western United Gas & Electric Company, 65 per cent of the employees of the former became stockholders of the parent company. This fact is one of the elements in the new spirit which has taken possession of this property.

CHAPTER VI

Progress in Accident Mitigation

THE consistent effort that is being exerted by electric railways to control the accident situation is producing substantial results. The 1924 presentations contained an impressive record of good results from organized safety work. For example, the San Francisco-Sacramento Railroad, which has not had a passenger killed or injured since it began operation in 1910, came through the past three years without an employee killed. Not a trespasser on the right-of-way has been killed since 1918 and but three persons at crossings since 1919. This system comprises 105 miles of track, of which one mile is on a 4½-per cent grade, nine miles are on from a 1½ to 2-per cent grade, and 6.7 per cent is on trestle work (one trestle alone being 13,571 feet long). There is a car ferry in the middle of the route over which both freight and passenger trains must be carried over Suisun Bay and there are two drawbridges which must be crossed. The road also passes through a 3500-foot tunnel and for twelve miles is in a mountainous district where many curves are encountered. Moreover, operation at 60 miles per hour is necessary on account of steam railroad competition.

On the Interstate Public Service Company lines, which traverse congested sections over a large part of their route, especially in Indianapolis and Louisville, there was not a single passenger fatality between Aug. 1, 1923, and Aug. 1, 1924. In this period the car-mileage increased 12.2 per cent and the passenger traffic 6.8 per cent. By its safety efforts the Union Street Railway has reduced the number of accidents over 30 per cent, and the Aurora, Elgin & Fox River Electric Company had but one accident of any kind during the past year for each 12,415 passengers. The Northern Texas Traction Company, between 1922 and 1923, made the phenomenal reduction in accidents for which the company was responsible of from 0.386 accident per 10,000 car-miles to 0.015 accident, or 95.5 per cent.

Less striking but equally significant was the reduction from 461 accidents during the first half of 1923 to 270 during the same period of 1924 in Charleston. This is a 41 per cent reduction.

It would be expected that a notable saving in costs of settling accident claims would accompany the improved operating methods. A good example is the Shreveport Railways, which has brought down its damage settlements from 5 per cent to less than 2 per cent of gross earnings.

The United Railways & Electric Company in 1923 saved $62,300 in accident costs as compared with 1922, which followed decreases of nearly $64,000, more than $114,000 and nearly $240,000 for the preceding three years, respectively. In unit terms, the 1923 costs were 3.29 per cent of gross as compared with 3.71 per cent for 1922, and the costs per 10,000 car-miles were $92.82 and $107.96 for the two years respectively.

Comparing the first six months of 1923 and 1924, the "Charleston Consolidated" spent $26,402 in settling claims in the former and $6,810 in the latter. The Aurora, Elgin & Fox River Electric Company has now been able to reduce these costs to less than 1⅓ per cent of gross earnings.

Corresponding to the accident record given for the San Francisco-Sacramento Railroad, its cost on this account are remarkably low. During 1923 nothing was expended, and for six years ended June 30, 1924, $2,605 was paid to passengers for accidents, which were of such a nature as tripping over suitcases in aisles, tripping over cattle guards and pinching of hands in doors. In percentage of revenue this amount is negligible. During six years ended June 30, 1924, $18,025 was paid on account of employee accidents under the state compensation law, although in no case was the company at fault. Of this $2,500 was for death, $2,500 for permanent injury, $6,621 for medical service and the balance for all other compensation. Even under these conditions, for every $1,000 paid out for labor, but $5.40 was paid for medical compensation and all other claims, and for the first six months of 1924 this was reduced to $3.95.

Referring again to the Northern Texas Traction Company, this railway after making in 1922 a reduction of nearly 75 per cent in cost of accidents for which it was responsible, as compared with 1921, followed this in 1923 with a further reduction of over 20 per cent. This is a reduction of nearly four-fifths in two years.

Such a remarkable showing in accident cost reduction lends interest to the methods used in bringing this result about. These are of three general types; (1) betterment of equipment; (2) improvements in operating methods; (3) securing and maintaining the co-operation of employees and public.

How Accident Costs Are Being Controlled

The excellent record of the San Francisco-Sacramento Railroad was cited. Obviously this would have been impossible without the most minute attention to safety precautions. On this line there is at one point a sharp curve at the foot of a grade. Car operation here is controlled by block signals, but an additional safeguard has been provided automatically to stop a car if the speed exceeds a predetermined maximum.

The cars of this company are equipped with train stop valves located on the roof and these engage arms which are attached to, and work in conjunction with the block signal blade. The speed-control device has a pole set at a signal location and it is provided with a stop arm, normally set at stop. At a properly selected point in the speed-control section a time-element relay, actuated by track-circuit relays, is started by the train and at the completion of the time element the stop arm goes to clear for the approaching train. Should the train arrive at the stop arm before the expiration of the time allowed, an emergency application of the brakes would be made by the roof valves being struck by the stop arm.

The company's motor cars also are provided with auxiliary electro-pneumatic brakes, in addition to the regular air and hand brakes. These are of the dynamic type, operated from their own storage supply of air, and by means of a small 4-position valve in the motorman's cab. When this valve is moved to emergency position, the first switch cuts off the supply to the main controller wiring and moves the reverser into the reverse position. The second movement, occurring 6 seconds later, cuts out some resistance, and the third movement, 5 seconds later, cuts out the balance of the resistance. This brake will not stop a car on a steep grade, but tests on a 4.6 per cent grade showed that it will slow a car to the speed of a man walking beside it.

The brake is available when brake rods become broken, air supply is gone and the trolley is off the wire. It is an insurance against a car being without braking power on a steep grade, particularly the 4½ per cent grade which exists in one of the large cities served by the railway. The foot of this grade is in the middle of the business district of the city.

It should be mentioned that the hand brake used on these cars has its own set of rods and levers from the platform staffs to the main equalizers on the trucks. It is not connected to the system of levers and rods used with the air-brake system.

Safety Telephones and Cords

The interurban cars of the Interstate Public Service Company have been supplied with safety telephone connections devised by the engineering department. The telephone located in the vestibule of the car is equipped with a "super-service" type of telephone cord and telephone hook. The hook has an 18-inch insulated handle and in it is a lightning arrester of the spark-gap type. When the hook is connected in the jack-box, and ready for service, the connections are such that if a surge should arise on the line it will be conducted directly to ground by way of the spark gap, which is visible to the operator.

In addition to this protection there is in the car a heavy rubber mat in such a position that the operator stands upon it when using the telephone.

Other examples of car equipment improvement are found in Baltimore. There the United Railways & Electric Company has, for example, eliminated one source of accident by removing projecting fenders, which were formerly used in connection with H-B life guards, from all cars, with the approval of the Public Service Commission. These fenders were particularly troublesome at curbs and on curves where the clearance was close. Incidentally a saving in maintenance cost, estimated at not less than $13,500 annually, has also resulted.

This company, also, during 1923 installed circular grab handles extending around the fare boxes on 974 cars. These the passengers grasp while paying their fares. They have effected a material reduction in accidents during boarding. Many other improvements made by the "United Railways" are listed later in this chapter.

The practice which some electric railways have followed in using bright colors as accident preventatives has another adherent in the Interstate Public Service Company. During the past year this company replaced the red and Pullman green formerly used on its cars with a vivid orange, which does not blend with the summer foliage as do the other colors. The change has also pleased the public taste as well as accomplishing its primary purpose.

An unusual piece of work was done recently by the railway in Fort Worth in the voluntary paving of strips on each side of East Fourth Street in order to provide ample driveway for vehicles. The railway desired to install a single-track line on this street, but realized that the street as already paved with a width of 22 ft. from curb line to curb line was not wide enough. The track was laid in the middle of the street and, solely as a means of accident prevention, the paving was extended by the railway 3 feet on each side for a distance of a mile. East Fourth Street is one of the main exits from the city to the east and is in constant use by automobiles. Before the widening it was inadequate for the traffic even without the car line. Now it is ample for all of the demands upon it.

Safety Expedients Along the Right of Way

In order to render the operation of its trains safer the Interstate Public Service Company has eliminated many curves on its mainline tracks. An incidental advantage of this is an increase in allowable speed, amounting to from 5 miles per hour to a maximum of 40 miles in an extreme case. In the protection of crossings on its line this company has had excellent success in cutting down accidents by means of signal bells.

To reinforce all other safety precautions the San Francisco-Sacramento Railroad has installed automatic block signals over its entire line, and has placed wigwag signals at every crossing where the view of a motorist is apt to be obstructed in any way, or where the traffic is heavy. In connection with the wigwag, an advance signal is located 1000 ft. ahead of the crossing so that the motorman can know whether or not the wigwag is operating. When thus notified that the wigwag is inoperative, which seldom occurs, he is required to send a flagman ahead to protect the crossing. Practically the operation of this rule does not slow up the schedule, and danger of accident at grade crossings is minimized.

Large Use of Signals in Baltimore

The use of signals has been carried far by the United Railways & Electric Company. For example, last year the company took over a short stretch of single track which did not formerly belong to it. Before responsibility for operation was assumed, the track was equipped with signals.

The high-speed line from the city to Sparrows Point and the Guilford Avenue Viaduct, which is practically an elevated railway operated with surface cars, are similarly safeguarded. On all curves where danger of collision exists signals have been provided.

Where this company's lines cross drawbridges, signals have been placed to stop cars when the draw is open. The signals are interlocked with the bridge so that the latter cannot be operated unless the signal has first been set at "stop." At one drawbridge crossing Bear Creek, which is frequently opened for the passage of boats, an automatic device has been installed in connection with the signal to stop a car if its motorman disregards the signal.

Where highways make dangerous crossings with the "United Railways" lines, and at railroad crossings not protected by interlocking, wire glass "stop" signs have been installed. There are seventy-two of these. They replace red semaphore signals which were discarded on account of confusion with automatic block or interlocking signals.

Keeping Shop Men Off the Tracks

The main line tracks of the Interstate Public Service Company go through the grounds of the Scottsburg shops. In fact, they pass between the carpenter-paint shops and the machine shop and general offices. Employees crossing the tracks from building to building would not use a specified path, but incurred danger by crossing anywhere. Last year the company greatly reduced the danger of accident by fencing in the shop grounds so as to leave but one opening through which the track can be crossed.

Operating Methods as Related to Safety

After the best possible physical equipment has been provided to assist operatives in doing their work with a high degree of safety there are improvements which can often be made in the use of the equipment. The first requisite is a set of satisfactory operating rules. It was, therefore, an important step in the direction of safety that was taken last year by the United Railways & Electric Company in the revision of its book of operating rules. This was the work of a special committee, requiring several months of painstaking work. With the same end in view the Interstate Public Service Company has prepared special rule books for the maintenance of way, shops and yards departments.

An operating detail which has proved effective on the San Francisco-Sacramento Railroad is the indicating of all meeting points on the operating time card in red, thus calling the attention of the trainmen forcibly to these points. This company's time card recently drew high commendation from the supervisor of timetables of the Southern Pacific Company.

Having provided good rules, the next step in minimizing accidents is analysis of the individual records of trainmen. The Northern Texas Traction Company, mentioned in last year's "brief" as having specialized along this line, reports for this year a continuation of this effort with good results. The number and cost of accidents was reduced despite the presence in Fort Worth of 5,000 more automobiles and an increase of over 100,000 revenue car-miles of operation by the railway.

Special interest attaches to methods used in stimulating attention to accident reduction. Of these, examples from this year's presentations will be given.

Dividing Savings With Trainmen

The Memphis Street Railway uses an original plan for dividing with the car men, on a "50-50" basis, any reduction which they effect in the accident cost below a specified percentage of the gross revenue.

In order that this plan may be effective there must be a prompt measure of the results of their work, which are indicated in part by the lawsuits begun in a given month and in part by the actual amount paid out in settlement of claims during that month. Experience has shown that the ultimate cost of accidents not settled by agreement is 6 per cent of the amounts sued for, hence this amount is added to the amount paid out in settlements as a basis of calculation. It is true that lawsuits are not begun immediately, but they are usually begun or claims are filed and settled within sixty days. As savings are divided with the men every three months, there is a close relation between these savings and the efforts which produced them.

The specified allowance for accident costs is $4\frac{1}{4}$ per cent of the gross revenue, this having been the average amount paid out during two years previous to the inauguration of the plan, calculated on the above basis. If this percentage is exceeded in any period, the excess is absorbed in the next following period before a dividend is declared.

The shares of the men in the dividend are pro-rated on the basis of man-hours worked, no man participating who was not in service on the last day of the three-months period covered.

Regular meetings of the men interested are held in connection with this plan. On the first Tuesday of each month the officials of the transportation department, the car men's union and the claims department meet to discuss the subject of safe operation. On the following Tuesday, meetings are held at times convenient respectively for day car men and night car men, for the discussion of the previous month's operation. Good work is commended and faults in operation are pointed out. Three-fourths of the car men attend the meetings.

The tangible results of the Memphis plan are shown by the accompanying tables.* The reduction for last year is the more noteworthy because there was an increase of 25 per cent in the number of automobiles and trucks which were in operation on the streets of Memphis.

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*In March, 1925, the company informally reported even better results.

TABLE I

DIVIDEND TO MEN UNDER "50–50" PLAN

Period ended	Savings	Men's share, cents per hour
Sept. 1, 1923	$12,244	1.75
Dec. 1, 1923	8,762	1.27
Mar. 1, 1924	10,128	1.45
June 1, 1924	15,240	2.10

TABLE II

GENERAL RESULTS "50-50" PLAN

Period covered	Number of accidents	Cost in percentage of gross earnings
June 1, 1922 to June 1, 1923	2,937	5.59
June 1, 1923 to June 1, 1924	2,716	4.03

But the results of this accident-prevention work go far beyond the reduction in numbers of accidents. The company officials have found that the following advantages also accrued:

The full and frank reporting of all accidents, however trivial, is encouraged.

Employees are stimulated to treat passengers courteously to develop gross revenue in which they have a personal interest.

Good feeling between management and men is fostered, and careless, indifferent and incompetent men are made to realize that they are out of place.

Graphical Presentation of Accident Data

In Charleston, the "Trainmen's Accident Report" is a center of interest in the transportation department. This report is graphical, being presented on a chart cross-ruled to show, in one direction, trainmen's names and badge numbers, and, in the other direction, the dates. Thus for each man there is a square for each day, and in this his accident record is depicted by means of pins, with colored glass heads. The following types of pinheads have been found convenient for the several classes of accident recorded: (1) boarding and alighting, yellow with red cross; (2) collision with vehicle, red; (3) collision with car, dark blue; (4) derailment, black; (5) ejectment, light blue; (6) miscellaneous, white with black cross.

This chart is mounted in a glass-covered wood frame 41½ in. by 30½ in. in size, which is located in the dispatcher's office and kept locked.

The trainmen watch this board carefully and are jealous of their accident records. As a test of watchfulness, pins are occasionally "spotted" incorrectly, and always with immediate protest from the men affected.

The rating of each man with respect to his accident record is made up as follows: five points for each accident; five points for a late accident report (shown by a yellow pin with white dot), and ten points for an unreported accident (shown by a pin with a plain glass head).

The "Charleston Consolidated" also finds valuable an "Accident Location Chart," which is a map of the city on a large scale showing the railway lines. Accidents are "spotted" on this with pins of the types mentioned, showing the types of accidents which prevail in different localities. The result has been undoubtedly more careful operation at dangerous street intersections.

By way of encouragement to safe operation the

Shreveport Railways gives star badges and new uniforms to men who have made especially creditable accident records. On the Union Street Railway the encouragement takes the form of commendation of employees who have averted accidents or who have acted creditably in connection with them. The proper department head personally compliments the man, and the news of this commendation spreads, impressing the employees with the fact that good safety work is appreciated.

In Baltimore, as a means of safety training, accident record cards are distributed among the employees monthly, on which they enter their own records of mishaps or freedom therefrom. These are turned in at the end of each month.

An Effective Plan of Inspection

Inspection of a property from the safety standpoint is always valuable. Some of the ways used in providing for it were mentioned in last year's "briefs." Another is that which is being found satisfactory by the San Francisco-Sacramento Railroad. On this property a supply and inspection train goes over the system once a month. On it are the general manager, the heads of all departments and the safety engineer. The safety engineer holds "safety first" meetings en route, and inspects all structures, tools and materials with a view to making suggestions for improvement. No material is shipped out except on the supply train, so he thus has an opportunity to inspect everything.

On the train, also, is the watch inspector, who checks the watches of every section man, bridge man and line man. As gasoline motor cars are used by section crews and other employees, it is considered essential that watches be accurate to avoid collision.

Every three months a fire prevention engineer from an insurance company accompanies the party. He inspects the property from the fire prevention standpoint and the officials of the company carefully follow his recommendations.

In addition to the usual precautions for preventing fires the Northern Texas Traction Company has organized a monthly inspection of the property by one of the office employees, to insure cleanliness of the premises and also reasonable freedom from fire hazard. The inspector not only takes into account the "house-keeping," but he notes the state of the wiring and other conditions which bear on the matter of fire risk. He reports to the superintendent of the company, who arranges to have his suggestions applied. At present the company is paying for fire insurance premiums 20 per cent less than a few years ago.

Discipline a Factor in Accident Prevention

After a company has done all that it can to reduce accidents by encouragement and emulation, there come times at which these plans do not avail, and more severe procedure is necessary. For example, in Charleston the supervisor last year had to suspend a 1-man car operator for a comparatively minor collision with an automobile. This was the thirteenth accident of the kind which the operator had had in eight months, and after careful investigation he was discharged, not for the particular accident but for his general inability to avoid accident.

The grievance committee of the local union protested on the ground that the discipline should not be retroactive, so to speak, but the superintendent supported the supervisor and the discharge was confirmed. On practically the same grounds another discharge soon followed and the president of the local resigned because he proved himself at fault in an accident soon after.

On this property the trainmen have been summoned to the supervisor's office in case of every accident, no matter how slight, for a review of the circumstances and advice as to the prevention of a repetition. The supervisor explains that operators divide themselves into three classes: the excellent operators, the good operators, and the "Jerries." The first are constantly studying the factors which may produce an accident and providing for them; the second lack foresight but are skillful in avoiding accidents, while the third are either greenhorns, misfits or mere time servers. Good discipline has among other features greatly reduced the "Jerry" class on this property within a year.

Getting the Employees' Co-operation

The assistance of employees in accident mitigation can be secured either individually or collectively. Individual assistance is facilitated by such a plan as that followed by the Aurora, Elgin & Fox River Electric Company. Trainmen are supplied with pads of "operaator's observation slips." On these they note facts regarding carelessness of vehicle operators in regard to violation of traffic regulations or laws. The license number of the vehicle, and the time, date and place of each occurrence are noted. The slips are turned in to the claims department at the close of the day, and this department writes courteous letters to the offenders explaining the danger caused by their actions. This plan is particularly useful in checking up men who drive trucks for others.

Safety Committees and Meetings

The committee plan appears to be generally satisfactory in organized safety work. A number of examples were given in the 1923 presentations, and others are described this year.

The safety organization of the United Railways & Electric Company centers in a safety committee of 104 members. The feature of this work which is especially noteworthy is the thoroughness with which safety information is conveyed promptly to all who are in a position to benefit from having it. With this in mind, a summary of the work will be given.

The safety committee is made up of a motorman and a conductor from each line, and representatives from the track, power, shop and car-cleaning departments and from the subsidiary bus company. In addition, a special committee of twelve, two from each division, is selected from the shops. The representatives from each department form a subcommittee, which meets monthly. Two hours' pay is allowed for attendance at night meetings. Members of committees are selected by superintendents or department heads every four months, and before each committee retires a dinner meeting for the entire group is held.

At the committee meetings, spot maps of accidents, showing location and character, are discussed, and the specific causes of accidents and hazards are explained. In each case the questions asked are: How did it happen? Why did it happen? How might it have been averted? How may similar accidents be avoided in the future? An analysis of the numbers of accidents by causes, is made a feature. Each member is called upon for a report, or asked or his views on subjects suggested by the chairman or by his own knowledge and observations. Effective use has been made of questionnaires to focus the attention of members on possible accident hazards.

The committee prepares statistical reports and charts showing the progress made by the company in controlling the situation and giving the relative standing of different lines. These are based on statements from the claims and other departments.

The purpose of the committee is to spread its information over the entire organization. To this end, regular reports are sent to the management. Line superintendents are supplied with monthly reports and in turn furnish this information to street inspectors. Supervisors have access to all special accident reports and are encouraged to attend safety meetings. When they talk to the men on the different lines, special information is furnished them by the committee.

To reach the rank and file of the organization, special bulletins are issued frequently. The committeemen, also, are expected to spread information in their own departments. It is the duty of the line superintendents and street inspectors to pass along the facts which they receive regularly, and of the supervisors to lecture to the employees from time to time. The chairman of the safety committee does extensive field work, coming into contact with a large number of employees each month. Meetings of foremen and others are held in the shop, power and other departments at intervals, safety cards are placed in pay envelopes several times each year and articles on safety are published frequently in "Trolley Topics," the company publication.

A set of accident charts is kept in the office of the safety committee, to indicate the location and character of all accidents. This is done by means of colored pins. These charts are exhibited at meetings, and are studied to locate sources of abnormal numbers of accidents.

As a result of the activities of the safety committee, the following, among many other improvements, have been made: New roof steps have been placed on cars, providing a hand hold and better foot hold; door locks have been installed to prevent doors coming open on the closed side of cars; screens have been placed on side windows of cars; changes in lighting arrangement have been made on 1-man cars to prevent glare from windows; highway warning signals have been installed at numerous locations; trolley catchers have been placed on the rear of cars; motormen's curtains have been improved; guards have been placed around hazardous machinery in the shops; goggles have been distributed to protect workers' eyes; boards have been placed over pits at the Carroll Park shops; a system of inspection to discover defective tools has been inaugurated; defective or hazardous ladders and scaffolding have been repaired or replaced; defective flooring and doors have been repaired; the latch hold on the towers of power department trucks has been reconstructed to keep the tower in place more securely; gas masks have been furnished for use in power stations where men may be required to go into a closed room with a Pyrene fire extinguisher.

The "United Railways" co-operates actively with the Baltimore Safety Council, organized just prior to the period covered by the company's presentation. The vice-president of the company and the chairman of the safety committee are members of the Board of Control, and the last-named is also chairman of the Council's statistical committee. This connection with the local council has given the railway an opportunity to reach the public effectively, particularly automobile drivers and school children.

Meetings for Discussion of Safety

Safety meetings are an important feature with the Interstate Public Service Company. At these, the employees are encouraged to make suggestions as to improvements in equipment or operating methods. Practically all of the feasible suggestions have been acted upon. In case a suggestion is impracticable, an explanation is made to the man who offered it.

During the past year the Northern Texas Traction Company introduced, as an educational safety measure, the practice of holding joint meetings of claims adjusters, transportation department inspectors and other interested employees. At these conferences claims department work is discussed from all angles.

Advertising the Safety Movement

After having done everything possible on the property to induce co-operation on the part of employees, a railway may properly ask the public to co-operate. A good place to begin is in the automobile garage. The Union Street Railway last year placarded all garages within 30 miles of New Bedford with large illustrated cards, each bearing a safety slogan. The cards depict accidents in which automobiles and electric cars are involved, and they are examined with interest by frequenters of the garages.

Signs of various sorts are found to be effective also. For example, the Aurora, Elgin & Fox River Electric Company has hung from the span wires at intersections of the railway and streets sign boxes carrying the word "Danger." The boxes have glass sides so that the signs can be illuminated at night. In Fort Worth this idea has been carried still further. At certain intersections where streets without car lines, and popular with speed loving automobiles, cross the car tracks, large warning signs are hung from wires stretched across the street. These are lettered "Look Out for Cars," in black on a white ground. They also are illuminated at night, and are placed one on each side of the street crossing.

The Northern Texas Traction Company, also, places warning signs on the span wires on its interurban lines, particularly where the lines leave the public highway for private right-of-way.

In its accident-prevention campaign the Interstate Public Service Company has made a feature of electrically lighted bulletin boards for the mounting of signs bearing safety suggestions. For the same purpose the "Charleston Consolidated" carries safety dash signs on all cars, arranged serially to provide variety and to cover the important principles of safe use of the highway. In New Bedford each car carries an inside card bearing a safety slogan. The cards are changed frequently.

Reaching the Public Intensively

Newspaper advertising is effective in spreading the idea of safety, and in addition, where an electric railway can secure real news for the local papers along safety lines the editors are glad to publish it. The Aurora, Elgin & Fox River Electric Company cites in this connection the news value of material furnished by the Illinois Committee on Public Utility Information. Public meetings and illustrated lectures on the subject are excellent in following up the newspaper publicity.

A detail in this connection is the use, in New Bedford, of a gaudy red sticker bearing the legend "Don't Get Hurt — Union St. Ry. Co., New Bedford, Mass." This is in the form of a seal and is placed on outgoing mail. It is about two inches in diameter and is thus very conspicuous on a piece of mail.

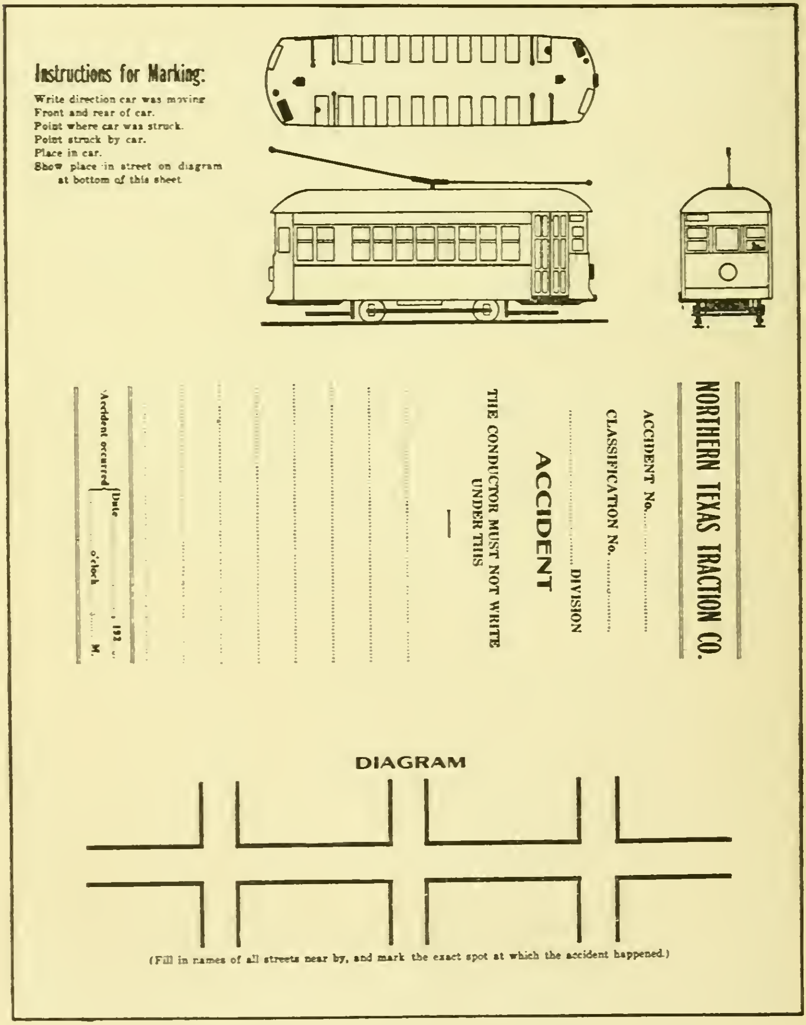
But after all it is the educational work in the schools that will bring the best results in the long run, and school authorities are increasingly pleased to co-operate in this work. In Charleston the railway company gives the usual talks in the schools but supplements them with safety material displayed on bulletin boards in the school corridors. For the same purpose the Union Street Railway hangs safety calendars in every school room in New Bedford. This company also furnishes pupils with buttons bearing the legend "Safety First," with "U. S. Ry. Co." on a tiny pennant in the center; as well as a liberal supply of appropriately printed blotters and rulers. The ruler is an especially effective safety advertisement because it is so long preserved and frequently used.

Where school children habitually disregard their own safety by holding on to city cars while bicycle riding, or by crossing the street dangerously close to electric cars the Aurora, Elgin & Fox River Electric Company notifies the parents and thus secures active co-operation.

Occasionally there is a special opportunity for putting over the safety message, such as that furnished this company by the last "Safety Week." To capitalize the general interest the company had drawn through the streets a flat car carrying a wrecked automobile with an apparently injured occupant. The motor car was painted white and safety slogans were painted on the sides and front. A different type of float was used recently by the Union Street Railway to teach the same lesson. A motor truck carried a platform on which was a school class, with its teacher, ostensibly learning a safety lesson. A representative of the railway dressed in white was evidently urging the class to be careful. This float received a prize in a competition.

Information for the Claims Department

After all possible precautions have been taken by a railway to prevent accidents, some accidents are bound to occur. These may result in claims or may justly require settlement even without claims. In order that justice may be done, both to the stockholders and the injured persons, full data are needed. Therefore, in closing this chapter on safety it is appropriate to refer to the accident report. A new form of report has been adopted by the Northern Texas Traction Company, the principal improvement being in the addition of a plan and two elevations (side and front) of a car. A part of the report form is reproduced below. On it a crew can readily locate the point at which a car was struck, or the positions occupied by injured passengers.



Instructions for Marking:

Write direction car was moving
Front and rear of car.
Point where car was struck.
Point struck by car.
Place in car.
Show place in street on diagram
at bottom of this sheet.

NORTHERN TEXAS TRACTION CO.

ACCIDENT No.........................

CLASSIFICATION No.........................

.... DIVISION

ACCIDENT

THE CONDUCTOR MUST NOT WRITE
UNDER THIS

Accident occurred { Date ...., 192...
.... o'clock .... M.

DIAGRAM

(Fill in names of all streets near by, and mark the exact spot at which the accident happened.)

This diagram assists operators in reporting accidents

1
DON'T DO AS I DID
I TOOK A CHANCE - AND LOST
TO HOOK A RIDE
2
3
SAFETY FIRST
SAFETY FIRST.
A GOOD LESSON TO LEARN.
4

PLATE XV — *(1) These cars teach a safety lesson on the Aurora, Elgin & Fox River Electric Company's lines.* (2), (3) *A "United Railways" first-aid team.* (4) *Safety float, Union Street Railway.*

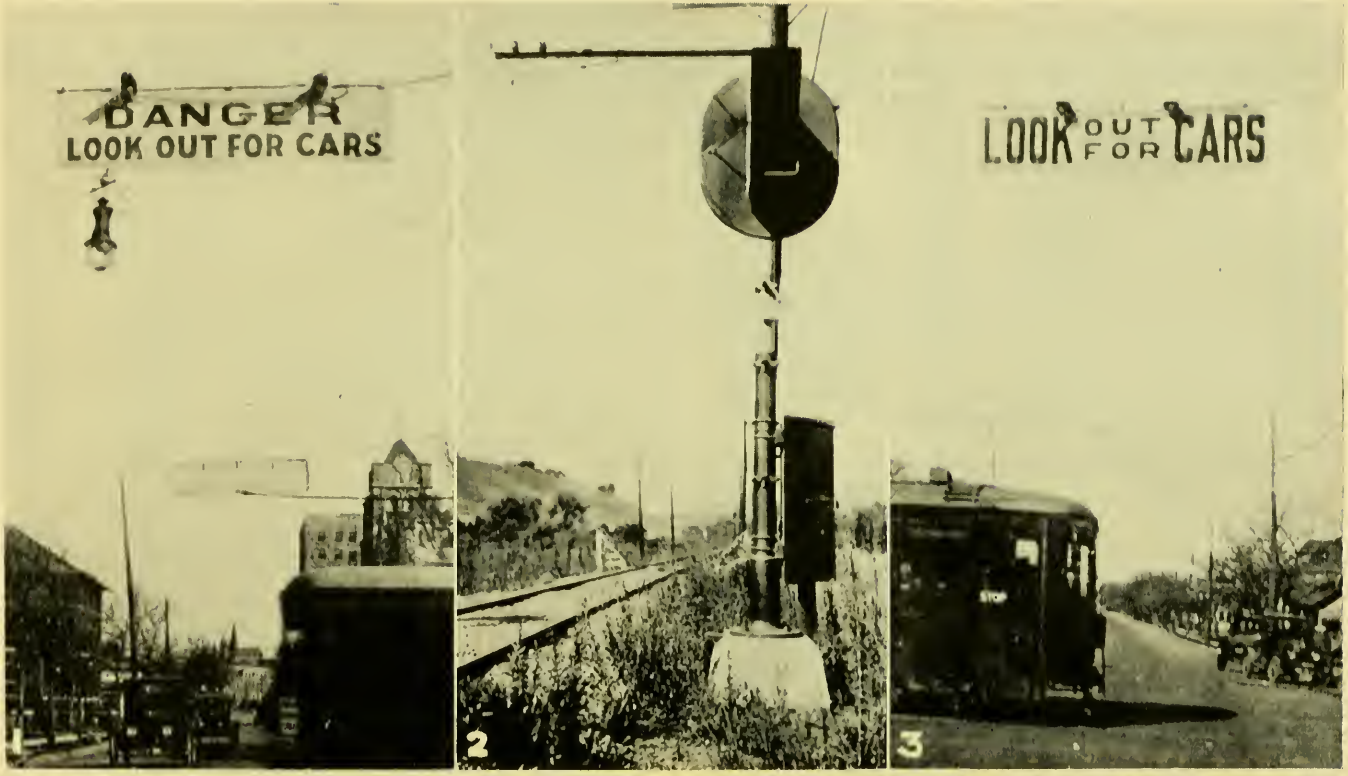


PLATE XVI — (1), (3) *Warning signs at railway crossings, Northern Texas Traction Company.* (2) *Standard block signal on the San Francisco-Sacramento Railroad.*

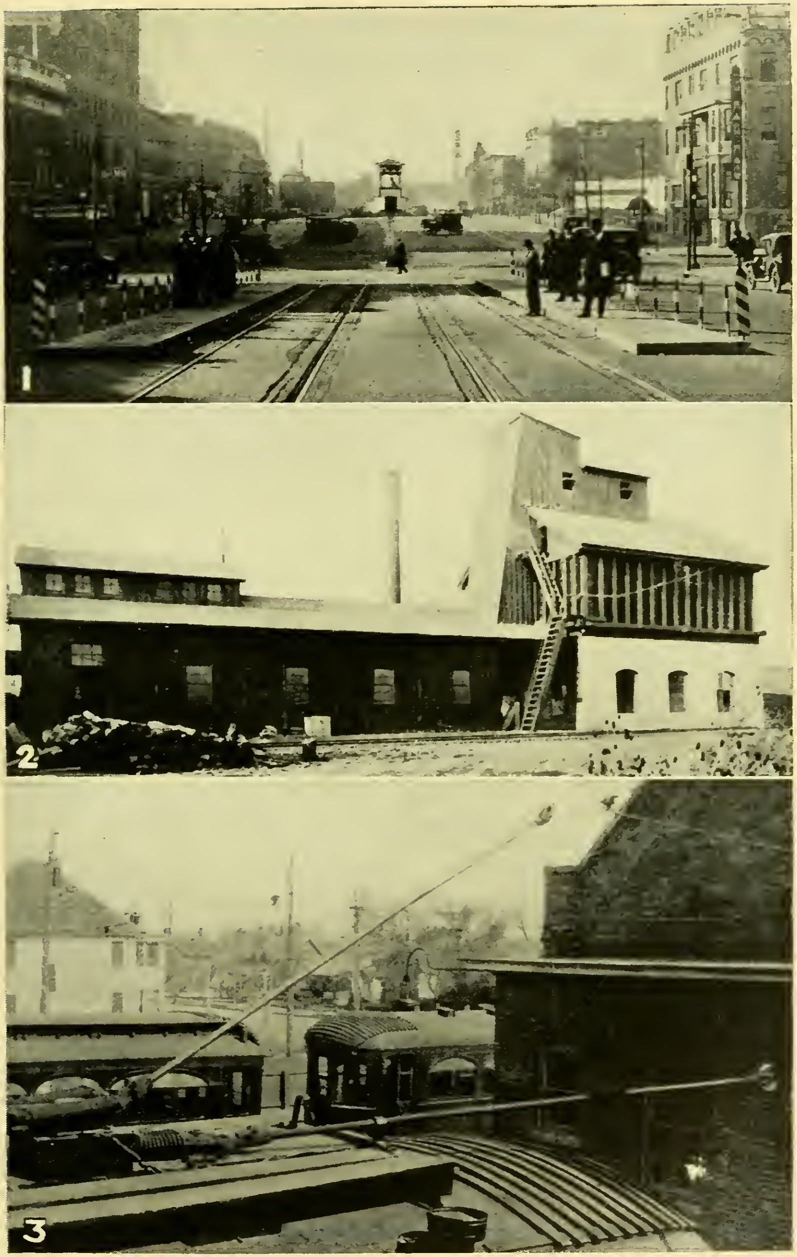


PLATE XVII — (1) *Sectional concrete loading platforms in Baltimore, Md.* (2) *"United Railways" sand-drying plant.* (3) *Double trolley pole, Northern Texas Traction Company.*

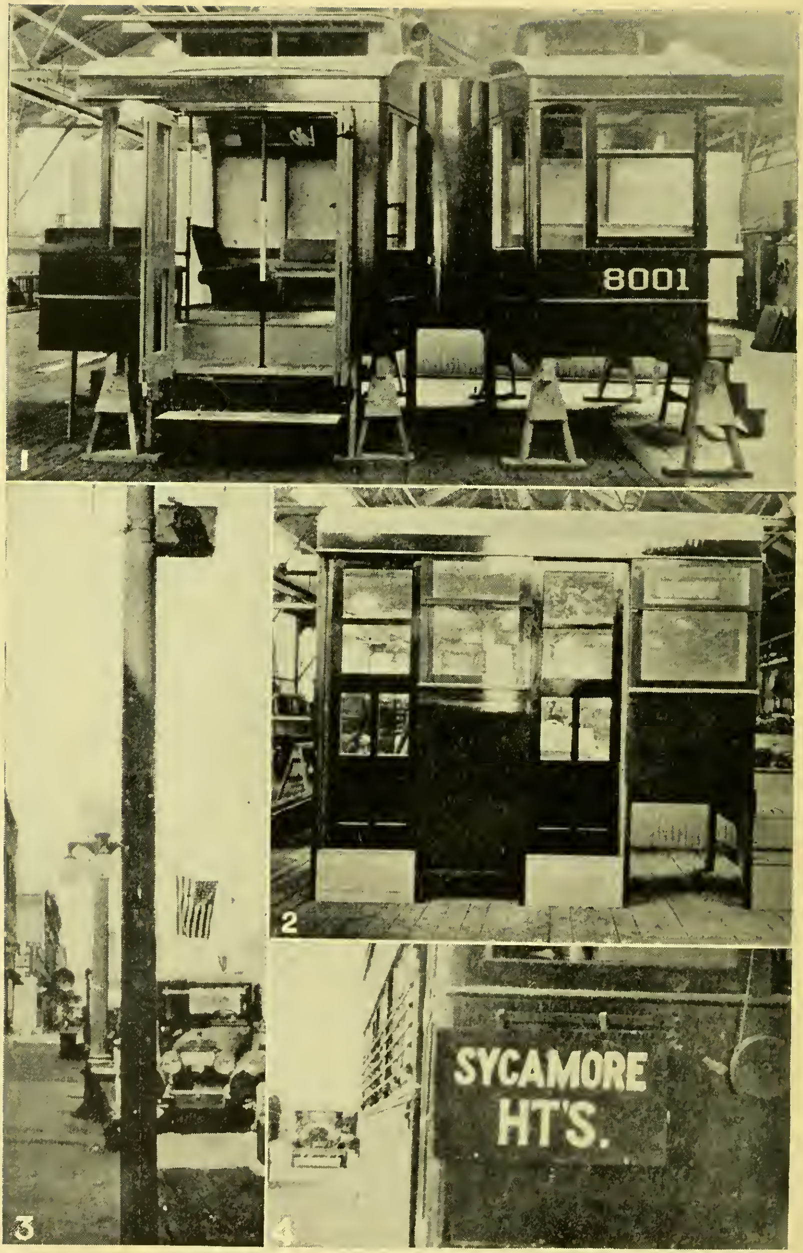


Plate XVIII — (1) *Shop model of 3-truck train for study, Baltimore.* (2) *Same, Peter Witt car.* (3) *Heater light-signal, Northern Texas Traction Company.* (4) *Dash destination sign, same.*

CHAPTER VII

Cutting Construction and Maintenance Costs

In the way, rolling-stock and power departments there are excellent opportunities for savings, both in construction and maintenance.

In the way department, there is a continuing tendency toward the relaying of track with heavier rail, as was pointed out in last year's digest. As an example from this year's presentations, the Interstate Public Service Company is replacing 60-pound with 80-pound rail on its interurban line. It is also re-fencing its right-of-way and improving its roadbed so as to permit of reduction of running time and reduce maintenance cost.

In New Bedford, the Union Street Railway, during the last season, renewed its tracks with 122-pound girder rail, welding the joints. This company last year installed a complete thermit outfit for the welding of rail and the making of special trackwork. A small but complete welding shop was built and several pieces were made. The outfit enabled the company to provide permanent employment to its most reliable track men, thus decreasing the expensive labor turnover which occurs every spring.

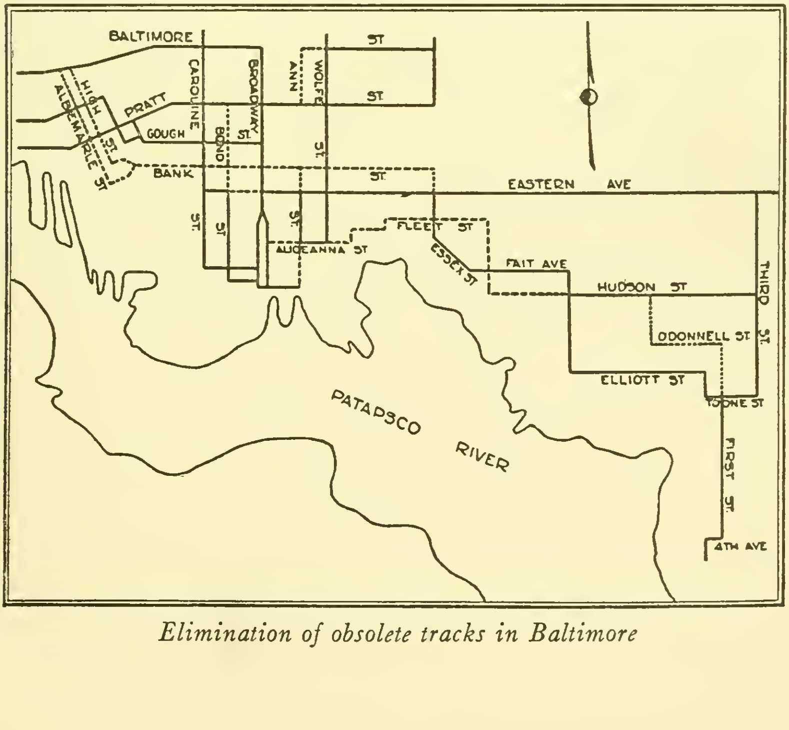
In Baltimore the standard Association girder rail is used in paved streets, but in the outlying districts where the track is of open construction 85-pound standard T-rail is used, laid on cross ties and stone ballast. This type of construction is carried into the city wherever possible, the tracks being laid in a reservation in the center of the street with a driveway on each side. Such construction not only permits of higher speed and better service generally, but it is less costly than paved-in track and is safer in operation, as other types of vehicles are kept off the track area. The track reservation divides traffic moving in opposing directions.

The San Francisco-Sacramento Railroad is replacing 60-pound rail with 70-pound rail on its interurban lines. On city lines in paved streets, 72-pound, 6-inch rail is being used. This is laid on mechanical ties in concrete foundation with the plates welded to the rails at all joints.

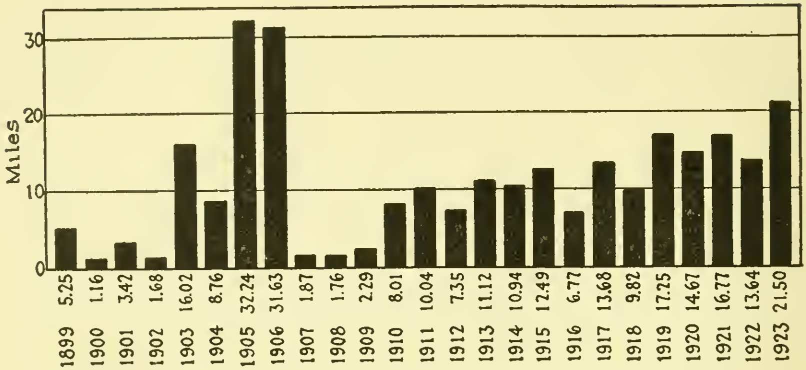
Inexpensive Construction of Diamond Turnouts

In Fort Worth last year it became necessary to install several diamond turnouts on single-track lines to permit reduction in operating headways. The track is of 70-pound low T-rail laid on a solid concrete foundation. The tangent track rails were utilized for the inside rails of the turnout. Thus it became necessary only to excavate a narrow trench at each side for the ties and foundation for the outer rails and to cut into the tangent track at the ends of the turnout to insert the frogs and switches. It was estimated that the saving in cost over the usual method of tearing out the tangent track and installing a turnout complete was about $1500.

In many cities there is track which either should never have been built or which has become obsolescent through changes in traffic conditions. Real economies are being obtained through correction of this condition. In Baltimore, where the railway system was formed by the consolidation of a number of formerly independent companies, there was naturally some duplication of track serving the same territory. The policy has been adopted that where tracks have become worn and require reconstruction, and where the same territory is served by parallel lines, instead of spending money for reconstruction, the track is abandoned and removed, and the service is rearranged accordingly. In the past four years about 8½ miles of unnecessary track has been thus abandoned, saving $335,000 in rebuilding cost and $50,000 in annual maintenance cost. At the same time



Elimination of obsolete tracks in Baltimore



Miles of track reconstructed annually in Baltimore, 1899–1923

the company is conducting a liberal annual reconstruction of the useful track, bringing it into constantly better condition.

The elimination of unnecessary track has also been an important factor in the bringing of the railway in Charleston back to a paying basis.

Welding Practice in Track Maintenance

In the 1924 presentations the railways testified to the excellent results secured through the use of welding equipment. The Union Street Railway, for example, utilizes welding in building up rail treads injured by corrugation. Three strips of hard steel are deposited by means of the arc on the tread, parallel to the length of the rail, the one nearest the gage line being ½ inch from it. This clearance is allowed to prevent injury to the smoothness of the gage edge. A new surface is then ground on this deposited metal.

The best results with this plan appear to be obtained in summer when there is less contraction of the metal after the welding than in winter. It is reported that after this treatment corrugation does not develop again for from 1½ to 2 years.

The Union Street Railway finds that badly battered joints can best be reconditioned by welding if the end of the rail head is first chamfered off, beginning about 4 inches back from the end and extending down through the head. The cutting is done with an acetylene torch, requiring about 10 minutes for the operation. When the space for welding metal thus produced is filled in with hard steel a new homogenous rail end is produced.

Rivalry Fostered in Way Department in Baltimore

The way department of the United Railways & Electric Company is organized in two main divisions, construction and maintenance. The reconstruction forces work under a supervisor who corresponds to the roadmaster on maintenance of way. There are several assistant supervisors depending upon the amount of work under way.

The maintenance of way department is divided into four general groups, each responsible for about the same number of miles and each having some suburban track. The foremen of these divisions report to a roadmaster. The rivalry fostered among the division foremen under this plan is beneficial to the character of the work.

The "United Railways" uses five portable air compressors to supply air for tampers and other pneumatic track tools and for concrete breakers, which form a useful part of the equipment. The company makes in its own shops about one-half of the special trackwork which it uses. A force is maintained in these shops continuously, permitting work to be turned out at a minimum of expense.

Due to the peculiar topography of Baltimore and the surrounding country, with its numerous waterways, hills, railroad bridges, etc., a large number of elevated and bridge structures must be maintained by this company. These are inspected not only by the engineers of the city and the company, but during the past year an outside engineering firm was retained to make an independent inspection and pass upon their general condition, factors of safety, etc.

Examples of Concrete Practice

For the purpose of placing concrete in paved track expeditiously and without interference from vehicular traffic the Shreveport Railways has mounted a concrete mixer on the rear of a work car which also carries the concrete materials. The mixer delivers the concrete directly into the track, and as the work car is a complete unit it is economical to handle. The company applies the same principle to its bonding and bond testing equipment, which is also carried on a work car. With it is a powerful lighting outfit which permits work to be done readily at night.

The San Francisco-Sacramento Railroad recently had occasion to reline with concrete a 3500-foot tunnel, formerly lined with timber. The ground through which the tunnel passes is soft, hence presented a problem due to its inability to hold its position after the removal of the timbering. Moreover, concrete molded in place would not have time to set during the night before the forms would have had to be removed to clear the tunnel for traffic in the morning. The company's engineers, therefore, devised a plan for using pre-cast concrete ribs which could be plugged into position immediately after the removal of the timbering. The rib sections weigh 4500 pounds each. They are cured for thirty days. To handle them a special crane was devised by the company. A patent has been taken out on this crane.

Concrete Platforms at Safety Zones

In Baltimore platforms were installed some time ago for the convenience and safety of passengers while waiting for and boarding cars. These were originally made of wood, but recently the United Railways & Electric Company adopted the plan of casting sections of platform of concrete at the yard. They are made of the width proper for the space and of a length convenient for handling. The concrete platforms are more durable, more attractive in appearance and much easier to keep clean.

This company has also abandoned the use of plank road crossings, using macadam instead. This is preferable because more durable, and its use eliminates the danger of punctures of automobile tires by nails projecting from planks of a wood crossing.

Partly as a way-department economy, the United Railways & Electric Company in 1923 built a commodious garage for trucks, etc., adjoining one of its important carhouses. This is triangular in form with a frontage of 138 feet on one street and 168 feet on another. It has a capacity of forty trucks, in addition to space for maintenance of way equipment, headquarters for overhead construction crews and a modern trouble station.

Among other recent way-department improvements of this company was the completion of modern open storage yards for cars at several points on the property. Loop tracks have also been located at points where the traffic warrants turning back service, and particularly for the two-car trains.

Better Shop Practice

Turning from the way department to the shops, one finds many examples of improvement, large and small. Among the economies in the maintenance of equipment which were effected by the Shreveport Railways within the period covered by its 1924 presentation several are worthy of note, as follows:

On the recommendation of the manufacturers, exterior ventilating fans were provided for the Westinghouse 306 motors, with a probable increase in the continuous rating of 50 per cent or more.

By changing thirteen double-truck monitor-roof cars to the arch type of roof, a saving of 600 pounds per car and an estimated reduction of $50 per year in maintenance cost were effected. The cost was $150 per car.

Alemite grease cups were applied to the motorman's valve on safety cars thus reducing maintenance cost by eliminating the necessity for getting to the interior of the valve for lubricating purposes.

By the application of a hand water pump in testing air tanks a highly satisfactory testing procedure resulted.

The use of cast iron welding rods, with an acetylene equipment, and flux especially adapted to this purpose, permitted worn journal boxes to be reclaimed efficiently. They are machined immediately upon cooling.

The Shreveport Railways also turned a piece of useless equipment to good purpose last year. It had a well-equipped and expensive sprinkler car which was necessary at one time because a city ordinance required it to sprinkle the streets. Later this requirement was rescinded. The tank and sprinkling apparatus were in due course removed from the car and it was converted into an excellent work car for handling materials and for ditching.

Making the Most of the Equipment

It has been the practice of the Union Street Railway to change the motors and electrical equipment of its cars from the summer cars to the winter ones and *vice versa* with change in season. By a fortunate purchase of second-hand motors, combined with the alteration of some of the cars into the prepayment type, this seasonal changeover has been reduced to a minimum.

As was mentioned in last year's digest, this company recently built over some express cars which had become useless as such on account of truck competition. One of these was made into a mail car, and the others made effective snow plows and scrapers. The work was done in the company's own shops. Among the products of these shops also was a wrecking car with a complete wrecking outfit including a work bench inside the car. A special derrick is located on one side for the purpose of swinging out pony trucks and placing them on the adjacent tracks. On the bumpers are several cast-iron sockets which serve as the receptacles for the ends of push poles. A red band painted on each tool indicates that it belongs on the wrecker and nowhere else.

The wrecker is manned by a crew of four men, including the master mechanic. A special signal calls them when an emergency arises, and they drop other work and hasten to the scene of need. Their overalls are in a locker on the cars and these they don as they are hurried to the job.

Double Collecting Gear on Interurban Cars

As was mentioned in Chap. I, the interurban cars of the Northern Texas Traction Company have been fitted with two complete current-collecting poles, one fitted with a sliding shoe, the other with a wheel. The appearance of the equipment is shown in Plate XVII. This results not only in less delay in operation but is a maintenance economy, as there is less damage in backing cars and damaged collecting gear can be brought into the shops for repairs.

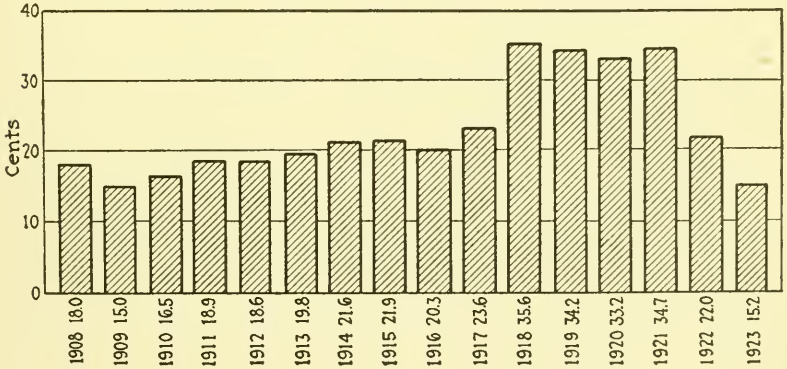
In the mounting of the collecting gear in the roof the trolley bases are placed as close together as possible on the center line, the rear one being mounted higher than the other to provide the necessary clearance.

Baltimore Goes to Steel Wheels

The United Railways & Electric Company has adopted steel wheels for all of its semi-convertible and double-truck cars. During 1921 it became evident that the cast-iron wheels in use were not giving the mileage that they should, due mainly to the chipping and breaking of flanges. The trouble was found to be in the service conditions. A committee of experts decided that rapid operation through special trackwork caused the trouble. This opinion was confirmed after wheels of different manufacturers with special composition and special flanges had been tried. The change was therefore made to steel wheels, with a marked reduction in congestion in the wheeling department, and the number of cars demanding new wheels is practically negligible. Study given to the subject of wheel turning has resulted in marked economy at this point also. Cars are now " reported for wheels " as soon as the flanges show a marked departure from the standard. By this means often only a slight turning, and, in some instances, only the turning of a flange, is required. This yields maximum results from a wheel with minimum cost.

Lubrication Practice Improved

Marked reduction in cost of lubrication of cars in Baltimore has been brought about mainly by the standardizing of certain practices. One relates to the method of saturating and distributing saturated wool waste, replacing the older plan of saturating it in the several



Lubrication cost per thousand car-miles in Baltimore car houses where it was frequently improperly saturated.

A large saturating tank was purchased, containing two compartments, one for saturating the waste, the other for draining it. Combined with this tank is an electric heating device thermostatically controlled. This apparatus insures uniform saturation in a minimum of time. Saturated waste is delivered on order to the several car houses.

Another factor in cutting lubrication costs is that the traveling inspectors of the shops department have lately followed more closely the oiling and packing of bearings.

Not only was the cost reduced by the above procedure but there are now fewer bearing troubles. In 1922 an average of 2,266 miles was obtained per gallon of car-box oil used. In 1923 this was increased to 3,457 miles, an increase of 52 per cent. The following table shows the results with all car lubricants, including gear grease, motor grease, compressor oil, etc.:

	Revenue mileage	Cost of all lubrication	Cost per 1,000 C. M.
1922..................	34,796,036	$7,695.74	22 cents
1923..................	35,873,841	5,446.74	15.2 "

Painting Economies

In many cases the paint shop offers opportunities for economy in car maintenance. The Charleston Consolidated Railway & Lighting Company, pressed to cut costs in order to continue operation, found it possible to save more than $60 in labor cost in painting each single-truck car. The use of gold leaf in lettering and striping was discontinued, along with the practice of striping the bodies in contrasting colors, and instead of the lettering of the whole company name on the cars but one word is now lettered. The labor cost was thus reduced from $150.87 per car in 1923 to $91.10 in 1924, with a corresponding saving in materials also.

The Union Street Railway started recently the plan of dipping instead of brushing fenders. A tank was built for the paint just large enough to clear the fender. This is filled two-thirds with water and one-third with paint. A light tackle permits the fender to be lowered through the paint into the water and then lifted out, after which it is allowed to drip.

The Northern Texas Traction Company has put into effect a new painting schedule by which every car will go through the paint shop every nine months. This has been made possible through the construction last year of a new reinforced concrete paint shop equipped with Fenestra windows, giving excellent lighting. It is protected against fire with automatic sprinklers. There is now capacity for ten cars in the paint shop, and this relief results in space for fifteen cars in the carpenter shop.

Better Facilities in the Shops

From all directions come reports of improved equipment in the shops in order that maintenance costs may be reduced. For example, the Interstate Public Service Company has established sheet metal and upholstering departments, and added to its machinery a power-driven sheet metal cutter, a punch and drill grinder, an electrically driven wheel lathe, a traveling crane and a boring mill. As a result work has been speeded up and shop costs reduced.

Among the pieces of shop equipment purchased in 1923–1924 by the Union Street Railway were the following: A 42-inch heavy duty wheel lathe used for turning steel wheels, the adoption of which has practically eliminated flat wheels. A metal-shearing machine installed in the carpenter shop and used for cutting plates and other metallic work. An acetylene generator added to the welding apparatus, permitting gas to be made for 1¾ cents per cubic foot as compared with a purchase price of 4 cents. Waterproof lamps installed in the pits, eliminating trouble formerly experienced in wet and snowy weather.

A useful portable motor equipment has been devised for use in the wood shop of the United Railways & Electric Company. It consists of an electric motor mounted upon a metal truck. The power developed by the motor is transferred through a flexible shaft, the end of which can be attached to different wood-working tools. By the use of this machine, work which otherwise would be done by hand can be done very much more rapidly. The possibilities of the machine are practically limitless and simply depend upon the ingenuity of the operator.

This company has developed an excellent plan for studying the details of new car construction. It is the practice to erect a model of a new type of car at the shop so that details of steps at entrance and exit, folding arrangement, etc., can be studied. Plate XVIII shows models built in connection with the purchase of the new Peter Witt type of car which is now being tried out, and with the three-truck unit study.

Excellent results are being secured in Fort Worth from the installation of an intercommunicating system of telephones by means of which the master mechanic and his foremen can communicate conveniently. Formerly it was customary for one foreman to have to look up another when he wished to discuss any point with him. Now he can talk without leaving his shop. The resulting saving in time has more than justified the cost, and the foremen can give much closer supervision to their work in consequence.

A Standard Form of Shop Report

Since Jan. 1, 1924, the Stone & Webster properties in the Texas district have been using a standard form of shop report which has stimulated a friendly rivalry among the company's local master mechanics. This report was designed by the Northern Texas Traction Company to permit one master mechanic to compare his maintenance practice with that of the other companies, which promptly adopted it.

The data for each report are entered in an 18-page book made up of mimeographed sheets of letter size. There are nineteen sections, as follows: Car changes, pairs of car wheels changed, car wheels discarded, armature changes, average miles between armature "re-winds," car painting costs, car overhauling costs, car-miles, lubrication, brakeshoe costs per M.C.M. (thousand car-miles), trolley wheel cost per M.C.M., trolley slide cost per M.C.M., total current collection cost per M.C.M., maintenance cost per M.C.M., total cost of carhouse operation, number of cars washed, number of cars inspected, wrecker calls and labor turnover. Data are given for the current month and the corresponding month of the preceding year.

When the repair shops of the United Railways & Electric Company were being built, provision was made in connection therewith for its general storeroom and storage yard. These are located at the Carroll Park shops, with trolley and steam railroad connections. Thus all of the material is centralized at this point, minimizing cost of handling and permitting close supervision over all supplies.

Model Stock-Keeping Methods in Baltimore

The storeroom is arranged with bins and open spaces to take care of miscellaneous materials, such as parts of motors, controllers, castings, glass, bolts, screws, etc., while the yard takes care of rail, ties, paving block, special trackwork, poles and other bulky materials. The storeroom is laid out to facilitate the classifying of materials, each group being segregated by itself as nearly as possible, to follow the recommendation for materials classification made by the committee on purchases and stores of the American Electric Railway Engineering Association. Also such articles as can be so prepared are put up in standard packages to facilitate handling, especially when an inventory is being taken, to conform to the stock-book system recommended by the same committee.

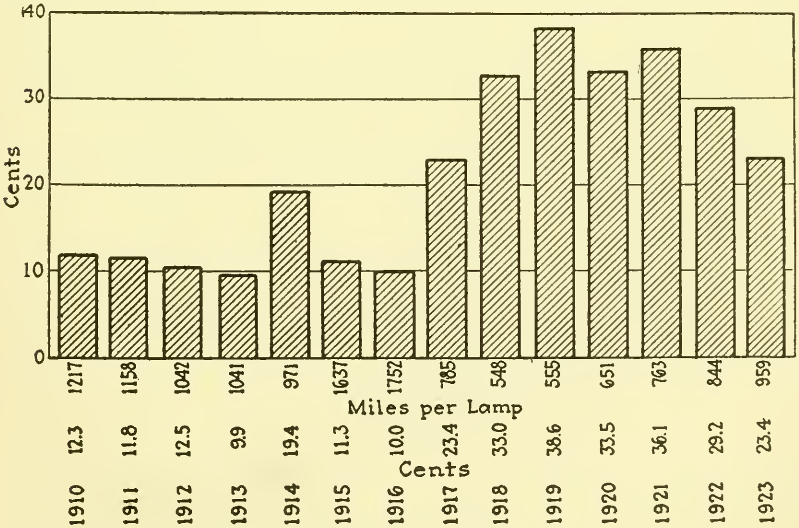
A detached oil house has been constructed for the storage and distribution of oils and other inflammable materials. This is used jointly with the shops department, which has a section in it for the mixing of paint and the storage of its daily supplies, such as paints, brushes, etc.

There are also two sub-storerooms, for the engineering and power departments, respectively, in which supplies are carried for the convenience of these departments.

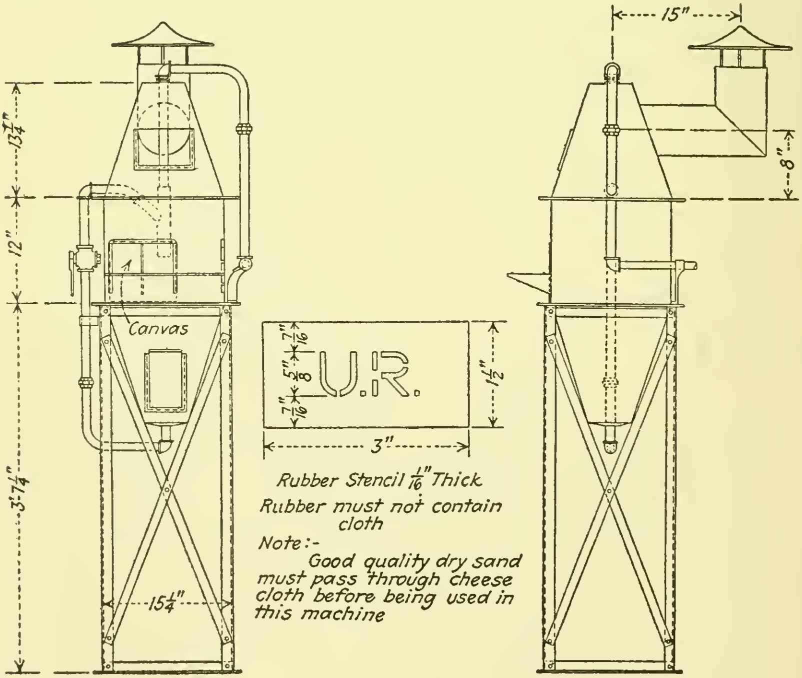
The general storeroom force endeavors to keep the storeroom clean and orderly, and it is white lined throughout to assist toward this end. Recently it was placarded with safety slogans as a warning to the men working in it, and those coming in contact with it, through delivering material, etc.

Cutting Down Incandescent Lamp Costs

The United Railways & Electric Company has reduced the cost of incandescent lamps in five years from 38.6 cents per thousand car-miles to 23.4 cents. There was an increase in mileage from 555 to 959 per lamp, the corresponding reduction in lamp consumption



Incandescent lamp costs per thousand car-miles in Baltimore being from 65,198 to 38,040. The reduction for 1923 as compared with 1922 was 4,112 lamps and there was an improvement in miles per lamp of about 13.6 per cent. This improvement was brought about through co-operation with the lamp manufacturers in the study of lamps in actual use. For a number of years the company has been gathering the defective lamps together and they have been gone over by a representative of the lamp company. He has thus been able to detect certain factory defects. Different makes of lamps have been compared with a view to eliminating those with unsatisfactory life. Tests are now being conducted in connection with the Harrison Lamp Works



Rubber Stencil 1/16" Thick

Rubber must not contain cloth

Note:- Good quality dry sand must pass through cheese cloth before being used in this machine

Machine used in Baltimore for sand-blasting lettering on incandescent lamps of the General Electric Company looking toward improvements in the 23-watt lamps.

The " United Railways " has adopted a sand-blast method for marking incandescent lamps which has been used successfully by the Norfolk & Western Railway. The principle is shown in the accompanying outline drawing. The sand-blast nozzle is supported vertically in the center of a sheet-iron chamber through the side of which a window permits the work to be inserted. Air is supplied through a vertical pipe and sand is drawn from the bottom of the chamber through a pipe which enters the nozzle at the side and at an angle of 45 degrees. Cocks in both pipes permit regulation of the supply. A window near the top of the chamber permits the work to be seen and a sliding door near the bottom gives access to the sand supply. Sand fron the nozzle, of course, falls to the bottom of the chamber. A hooded escape flue creates a draft which directs the dust away from the operator. The lettering is cut in a rubber stencil which is held around the lamp to be marked.

This company has made a number of improvements in equipment of its cars, including the addition of trolley catchers, aluminum lighting arresters and auxiliary contactors on controllers. Good results have been secured by nickel-plating hand holds on buses wherever the holds are exposed to the weather.

Results of Better Car-Maintenance Practice

As would be expected, the effect of the improved practices which have been introduced in the rolling-stock department of electric railways is reflected in the pull-in record. In Baltimore, where four years ago the cars pulled in per month for repairs averaged nearly 1,200 and where the number in one month, and February at that, was nearly 1,500, last year (1923) the average was only 415 and the largest number (in March) was but slightly over 500. Less than one-fifth of one per cent of the armatures on this property are in the shops for repair each day.

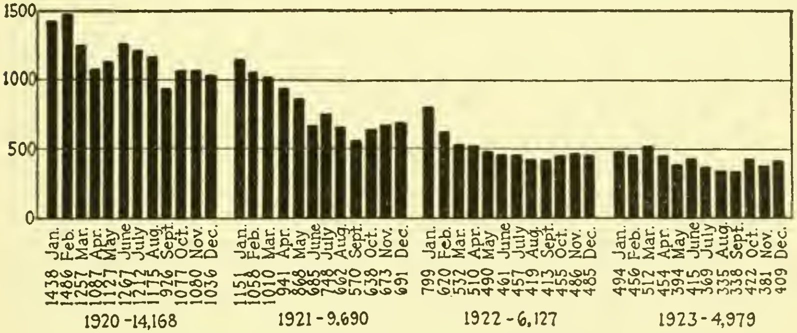
The pull-in record for the Union Street Railway for 1923 was 3.6 per cent of the total operated, or 5.5 cars for each 10,000 car-miles operated. On the " Charleston Consolidated " property four early months of 1924 showed an increased mileage per pull-in from 1,250 to 1,753 as compared with 1923. Also from July 1, 1923, to July 1, 1924, the stock of materials on hand was decreased from $50,500 to $39,500. In the same period the cost of equipment maintenance was reduced from 4.95 cents to 3.16 cents per car-mile.

Power-Plant Kinks from New Bedford

The Union Street Railway has accomplished some remarkable savings in its 7,000-kilowatt power plant during the past year. This plant is of modern type, but there were many small opportunities for improvement.

By the overhauling of the condensing system a saving of 50 per cent in water consumption was effected and the fuel consumption was brought down to 2.25 pounds per kilowatt-hour. To facilitate work about the plant and make it more interesting to the men, all of the piping was painted in appropriate colors to indicate its special function. Thus steam pipes were painted yellow, with red arrows to indicate the direction of flow of high-pressure steam and green arrows for exhaust steam. Water pipes were coated with aluminum paint. This painting permits the ready detection of leaks which cause soiling of the surface. The leaks are promptly repaired.

Special attention has been given in this plant to promoting friendly relations between management and men. The superintendent maintains a suggestion box and welcomes suggestions even if they are not signed. Each group of men have a section of the plant to which they are assigned and for the condition of which they are responsible. All machinery and piping belonging to the jurisdiction of a given crew is lettered conspicuously with a view to provoking competition.



Monthly pull-in record for four years in Baltimore

Then there is the "tag system" which is producing excellent results in maintenance. Employees are provided with serially numbered tags, which are in two sections separated by a line of perforations. The upper half, which is supplied with a piece of string for attachment to a pipe or machine, calls attention to some defect which has been noted. Any employee can attach a tag to indicate such a defect. The lower half is allowed to remain attached to the upper until the proper crew has made the necessary repair, which is supposed to be done immediately. Then the lower part of the tag is detached and handed to the chief engineer. The chief engineer, guided by the tag, inspects the repair work and when satisfied removes the stub of the tag. Only he can do this. As the tag is signed he has a record of the watchfulness of the men and the men get credit for their interest.

Through careful training of the men in the power plant of this company it is now possible to have all repairs made by its own employees, a feature which insures a maximum of interest in the upkeep of the plant.

Two Kinds of Fuel Available for Power Station

The Northern Texas Traction Company has for years used oil for generating steam at its Handley power plant. The oil is bought on a yearly contract basis, but the fluctuation in fuel-oil prices considerably affects power costs. Early in 1924 the price was 20 per cent higher than in 1923. Recently one of the large natural gas distributing companies built a pipe line near the Handley plant and offered the traction company a low rate with the provision that the supply of gas might be curtailed in case there was an insufficient supply for domestic uses. The boilers were equipped, therefore, to burn either oil or gas. During the summer of 1924 the gas was being used with a saving of from 25 to 30 per cent over oil. The company has storage for 65,000 gallons of oil, which is kept full and insured. The oil can be brought into use instantly in case of failure of the gas supply. This arrangement produces an ideal combination, for either fuel can be used as the principal one, depending on its price, the other automatically becoming the standby.

Use of Automatic Substations Increasing

Several of the companies making presentations in 1924 mention the benefits obtained from the use of automatic control in substations. The United Railways & Electric Company purchases its power and has used eight manually operated substations in converting the alternating current purchased power to the direct current form.

Increases in load requirements recently compelled a study of the power distribution facilities of the company, with the result that sites for four new substations were acquired and contracts let for automatic substations for these locations. This decision was reached on account of the better operating conditions with the automatic control, the saving in feeder cables on the direct current side, and the elimination of some substation labor expense. This program is more than one-half completed. The eventual cost will be $600,000, but there will be salvaged over 80,000 feet of 1,000,000-circular mil cable, and 500,000-circular mil 600-volt lead-covered underground distribution feeder. The removal of the latter will make a saving in duct rental of 6 cents per foot per year.

This company has installed the 2,000-ampere high-speed General Electric circuit breaker, complete with reclosing device and panel, which was exhibited at the

Atlantic City convention of the American Electric Railway Association in 1923. This has been connected in parallel with one of the company's feeder panels. It clears a short-circuit near the station before the current reaches one-tenth of a possible maximum, thus preventing flashing across the rotary converter commutator or setting fire to car controllers.

Automatic substations have also played an important part in the recent excellent operating results secured by the Aurora, Elgin & Fox River Electric Company and the Shreveport Railways.

Interstate Has Modern Power System

The Interstate Public Service Company has given much attention recently to the improvement of its power system. This company has at each end of its transmission line a large source of power and at about the center a power station. It has also on one division two small power plants which can be brought into operation as auxiliaries. Its substations, several of which have just been enlarged, are located about ten miles apart, each provided with two sectionalizing switches which can be used for isolating a defective section of the line without interfering with the operation of the system. Supplementing these switches are automatic circuit-breakers which immediately " kill " a defective section in case of trouble.

Concrete Poles Favored

In the field of power distribution, the principal items of interest come from Baltimore. After experimenting for several years with concrete poles the United Railways & Electric Company has adopted these as standard and had built a plant for making them. The advantages which appealed to the management were, in addition to the neat appearance, durability and low cost as compared with steel poles and, it is believed, in the long run with wood poles. This fact is recorded here because it indicates that the concrete pole has come to stay. It has been in use long enough to bring out its imperfections. The fact that a company as progressive as the " United Railways " is now beginning the general use of this type of pole is convincing evidence of its reliability.

Instructions for Clearing Cable Trouble

A useful manual, in mimeograph form, which has been developed by the power department of the " United Railways " is entitled " General Instructions for Clearing Trouble in Underground Feeder Sections." These instructions are for use in locating and correcting trouble due to " grounds." While the instructions are made as specific as possible, it is recognized that every possible case cannot be covered and all that can be done is to cover in a general way those cases that can be foreseen. The trouble men are advised to know the reasons for every move. Rules covering the duties of trouble crews accompany these instructions.

The general procedure in examining a grounded section is first to inspect the overhead portion of the section, and then to isolate the underground portions of the section beginning near the middle and eliminating portions until the trouble is located. A 5-light cluster of lamps or its equivalent is recommended for this test, the testing outfit itself being tested before and after each cable test.

A specific example of the instructions is as follows:

> Franklin Street Substation-Central No. 34
>
> First go over trolley wire. If no trouble is found proceed as follows:
>
> If crew ends at Howard Street start opening switches at Eutaw Street.
>
> Cables Nos. 127 and 128. Open switches on cables Nos. 127 and 128 at Fremont and Franklin Streets and cable No. 127 at Fremont Street and Edmonson Avenue, and close in switch on cable No. 92 at Fremont Street and Edmonson Avenue and No. 91 at Fremont and Franklin Streets to put Fremont Street on East Edmonson Avenue section and permit operation of Fremont Street cars.
>
> Then open switches on cables Nos. 127 and 128, as well as No. 117 on Franklin Street at Ogston Street, at Southwest Pine Street, at Greene Street and at Eutaw Street.
>
> Then close in cross-connecting switch with Madison Avenue section at Eutaw and Franklin Streets, and close cross-connecting switch with Madison Avenue section at Eutaw and Franklin Streets, and close cross-connecting switch with West Preston Street cables at Northwest Franklin and Pine Streets.
>
> Then have operator at Central substation test cable No. 117. If it is grounded, close switches on cables Nos. 127 and 128. If cable No. 117 is clear, put switch on same at Southwest Franklin and Pine Streets back in, and test cables Nos. 127 and 128 with test lamp and close in on clear cable.
>
> If No. 117 is grounded, test Nos. 127 and 128 with test lamp and close in on clear cables. If cable No. 128 is grounded, leave tie line with Madison Avenue section in, and open tie line with West Preston Street, and if either No. 127 or 128 is grounded leave trolley wire on Fremont Street between Franklin Street and Edmonson Avenue and East Edmonson Avenue section until grounded cable is repaired.

In concluding this review of some of the recent outstanding developments in track, rolling-stock and power lines, a few words regarding the engineering organization are in order.

It is the practice of the United Railways & Electric Company to hold weekly meetings of the engineering staff, superintendents and foremen of the several divisions for the purpose of discussing current problems of operation and matters of general interest in connection with departmental work. In order that these men might become more familiar with the properties and characteristics of trolley wire, it was decided to hold one meeting at a place where suitable mechanical tests of wire could be demonstrated. At the invitation of the head of the mechanical engineering department of the Johns Hopkins University the meeting was held in the college laboratory, where samples of copper, cadmium, phonoelectric and other wires were tested. Simultaneously with the testing, related subjects were discussed, such as the company's trolley wire specifications, limitations of wire, care in the erection and maintenance of wire, etc.

Co-operation With Manufacturers

An example of the possibilities in the way of making progress in electric railway maintenance through co-operation with the manufacturers has been mentioned. Along the same line are tests being made in Baltimore jointly by the "United Railways" and the Ohio Brass Company. The latter requested permission to install sample trolley ears of different composition in a stretch of heavily traveled line. The railway furnished a trouble crew and truck to make the installation.

These ears were of different compositions of brass and of malleable iron, some of the latter being galvanized and others copper-plated. With these ears were installed some standard ears from stock in order to secure comparative data.

In joining in this experimental work the railway company realized that data might be obtained that would be useful in solving a very difficult problem. No manufacturer and no railway had collected reliable data on the actual life of these devices under operating conditions. The railways do not have the technical staffs for this purpose, and the manufacturers cannot reproduce operating conditions. If, therefore, the manufacturer will furnish the technical staff to follow up such tests and the operating companies will furnish the testing facilities on their lines, it may be possible to overcome these difficulties with mutually beneficial results. If this experiment is successful it may be possible to extend the method with considerable practical benefit to the industry as a whole.

CHAPTER VIII

Economical Administration

AFTER consideration of some of the ways in which the physical equipment of a railway may be satisfactorily installed and maintained, attention is logically directed to the use of this equipment in furnishing good service. First in importance comes thorough organization of the personnel which handles the equipment of all kinds. Then close co-operation of the staff must be maintained. To illustrate:

Co-operation throughout the official organization of the United Railways & Electric Company is assured by the following procedure: The general manager has daily meetings with his department heads, and at least once a day goes over all matters of importance with the president. The superintendent of power, the superintendent of rolling-stock and shops, the chief engineer, the claim agent and other department heads have regular meetings of their aides, foremen and division chiefs. Every morning the superintendent of transportation goes over the plans for the day's operation with his seventeen line superintendents. Each of these has complete jurisdiction over one or more lines throughout their entire length. There is no division of authority over the men or the operation of the cars assigned to any line.

An important feature in any organization is preparation for emergencies, such as vacancies, illnesses, etc. For every position of importance there should be at least one understudy familiar with the duties of the one whom he is to replace if needed. The plan worked out by the Charleston Consolidated Railway & Lighting Company is typical of what is being done on many railways in one form or another. Understudies are provided as shown by the following tables:

UNDERSTUDIES FOR SUPERVISORY FORCES

Transportation Force

Position	*Possible understudies*
Superintendent	One receiver, one dispatcher (as supervisor)
Dispatcher	Two line inspectors
Chief operator	One line inspector
Three line operators	Two trainmen, broken in and experienced
Two receivers	One line inspector, one clerk
One clerk	One line inspector
One clerk (half time with claim department)	Interchangeable

Shop Force

General foreman	Carhouse foreman (day)
Carhouse foreman (day)	Carhouse foreman (night) and electrical foreman
Carhouse foreman (night)	Carhouse foreman (day)
Paint shop foreman	Not required
Carpenter shop foreman	One carpenter
Air-brake foreman	One air-brake man
Machine-shop foreman	One machinist
Electrical foreman	Carhouse foreman (day)

This company has greatly reduced its operating force in the railway department, by a careful reorganization, cutting down the number of employees in accordance with a plan of economy made necessary by diminishing returns. This table gives the details:

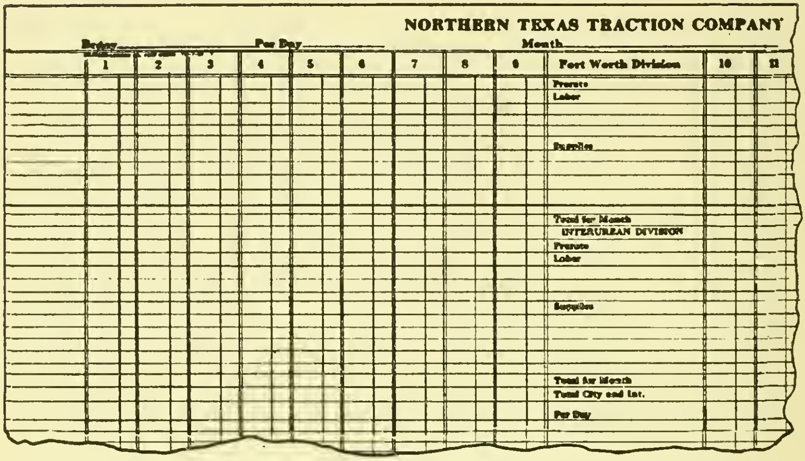
	Supervisory force excl. of supt.	Clerks	Trainmen	Shopmen
July 1, 1923..........	9	2	140	65
Jan. 1, 1924..........	6	2	108	47
July 1, 1924..........	7*	1½†	90	40

* Position of chief operator created.

† Includes half time of clerk in claims department.

With an effective organization of the personnel, the management is in a good position to secure co-operation in maintaining the property. As a stimulus to bringing out suggestions from employees, the offering of prizes has considerable value, and is widely used. In May 1924, G. H. Clifford, manager Northern Texas Traction Company, at one of the meetings which he frequently holds with city trainmen, offered prizes of $25, $15 and $10 respectively for the best three suggestions. Ninety-five per cent of the men responded and excellent suggestions resulted. The competition was repeated later for the interurban men, with a 100 per cent response.

In the spring of 1924 substantial prizes were offered by the United Railways & Electric Company for suggestions regarding improvement of service and increase in revenue. A first prize of $100, a second prize of $50, two third prizes of $25 each, and six fourth prizes of $10 each were awarded. The first prize was won by a motorman, who made a careful technical study of operating conditions and presented a highly creditable report. In all seventy employees submitted 123 communications, many of which contained more than one suggestion.



NORTHERN TEXAS TRACTION COMPANY

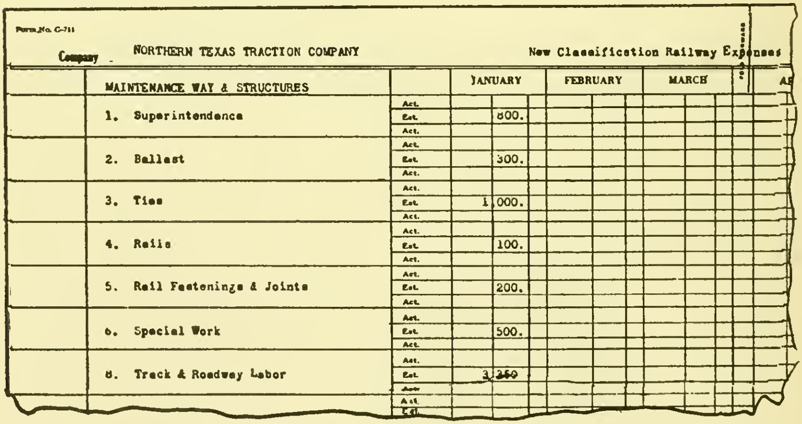
Bogey________ Per Day________ Month________

	1	2	3	4	5	6	7	8	9	Fort Worth Division	10	11
										Prorate		
										Labor		
										Supplies		
										Total for Month		
										INTERURBAN DIVISION		
										Prorate		
										Labor		
										Supplies		
										Total for Month		
										Total City and Int.		
										Per Day		

Form used in setting up monthly detailed "bogey"

Budget "Bogey" System Effective in Fort Worth

In furthering co-operation between the personnel and the management in controlling costs, some kind of a budget system is now used by electric railways generally. A particularly good form has been developed by the



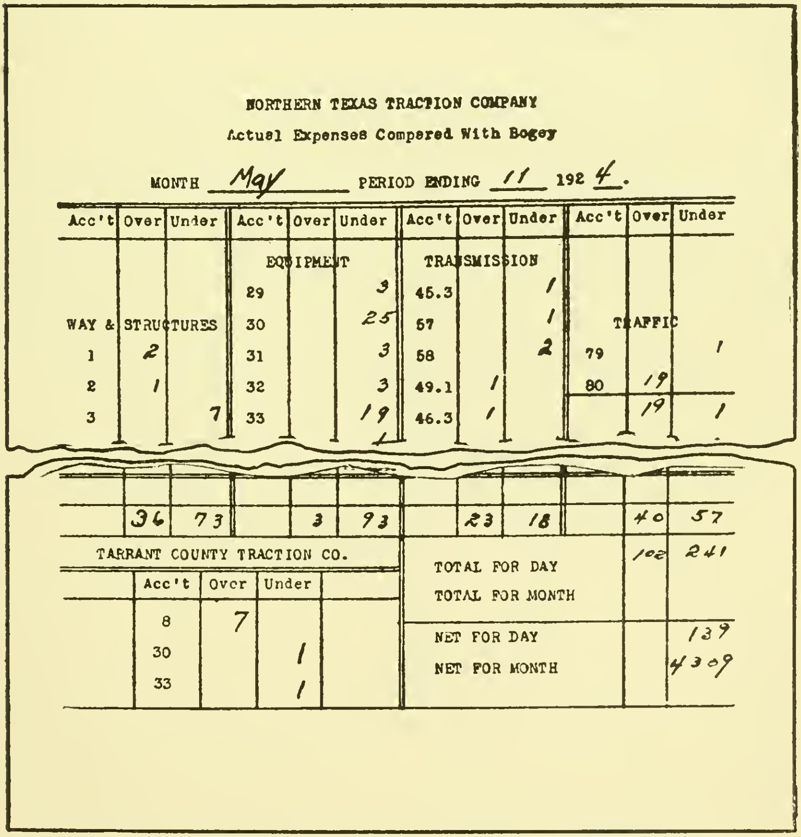
Form No. C-711

Company NORTHERN TEXAS TRACTION COMPANY New Classification Railway Expenses

	MAINTENANCE WAY & STRUCTURES		JANUARY	FEBRUARY	MARCH
	1. Superintendence	Act.			
		Est.	800.		
		Act.			
	2. Ballast	Act.			
		Est.	300.		
		Act.			
	3. Ties	Act.			
		Est.	1,000.		
		Act.			
	4. Rails	Act.			
		Est.	100.		
		Act.			
	5. Rail Fastenings & Joints	Act.			
		Est.	200.		
		Act.			
	6. Special Work	Act.			
		Est.	500.		
		Act.			
	8. Track & Roadway Labor	Act.			
		Est.	3,250		
		Act.			
		Act.			
		Est.			

Apportionment form for budget expenses of departments

Northern Texas Traction Company. The "bogey" estimates are made for a calendar year in advance and are set up in detail for each month. After the "bogey" has been worked up and approved by the manager the amounts allotted to the several accounts are typewritten on special "bogey sheets" ruled as shown on page 138. The "bogey" is in charge of a "bogey clerk," who daily enters all charges, including labor, against the proper accounts. He can thus prepare a statement on any day if required, showing just how the expenditures stand



NORTHERN TEXAS TRACTION COMPANY

Actual Expenses Compared With Bogey

MONTH May PERIOD ENDING 11 1924.

Acc't	Over	Under	Acc't	Over	Under	Acc't	Over	Under	Acc't	Over	Under
			EQUIPMENT			TRANSMISSION					
			29		3	45.3		1			
WAY & STRUCTURES			30		25	57		1	TRAFFIC		
1	2		31		3	58		2	79		1
2	1		32		3	49.1	1		80	19	
3		7	33		19	46.3	1			19	1
	36	73		3	93		23	18		40	57

TARRANT COUNTY TRACTION CO.

Acc't	Over	Under
8	7	
30		1
33		1

TOTAL FOR DAY	102	241
TOTAL FOR MONTH		
NET FOR DAY		139
NET FOR MONTH		4309

Sample expenditure statement issued by "bogey clerk" with relation to the amounts allotted to the different accounts. In practice he gets out these statements about every six days. The head of each department gets a copy of the statement, which shows whether the accounts in which he is interested are running over or under the estimate, and how much.

The keeping of these accounts by one " bogey clerk " results in a co-ordination of expenditures. The prompt distribution of the information tends to effect economies which might not be possible if the department heads had to wait for the more accurate cost figures in the regular monthly report.

Data the Basis of Intelligent Operation

The transportation utility furnishes fundamentally car and seat mileage and receives revenue therefor. From the operating standpoint it is just as important to know the relation of service furnished and required, as from the financial standpoint to know that of revenue and cost. Notable contributions to the methods of securing operating data have been made by the United Railways & Electric Company.

A Simplification in Traffic Analysis

In the course of an investigation made to determine average load factor on electric railway cars, W. H. Maltbie, attorney with this company, discovered a simple means for determining load factor, as well as average length of ride, for a railway system or one of its parts, and for any hours of a day or even for a single trip. It is as follows:

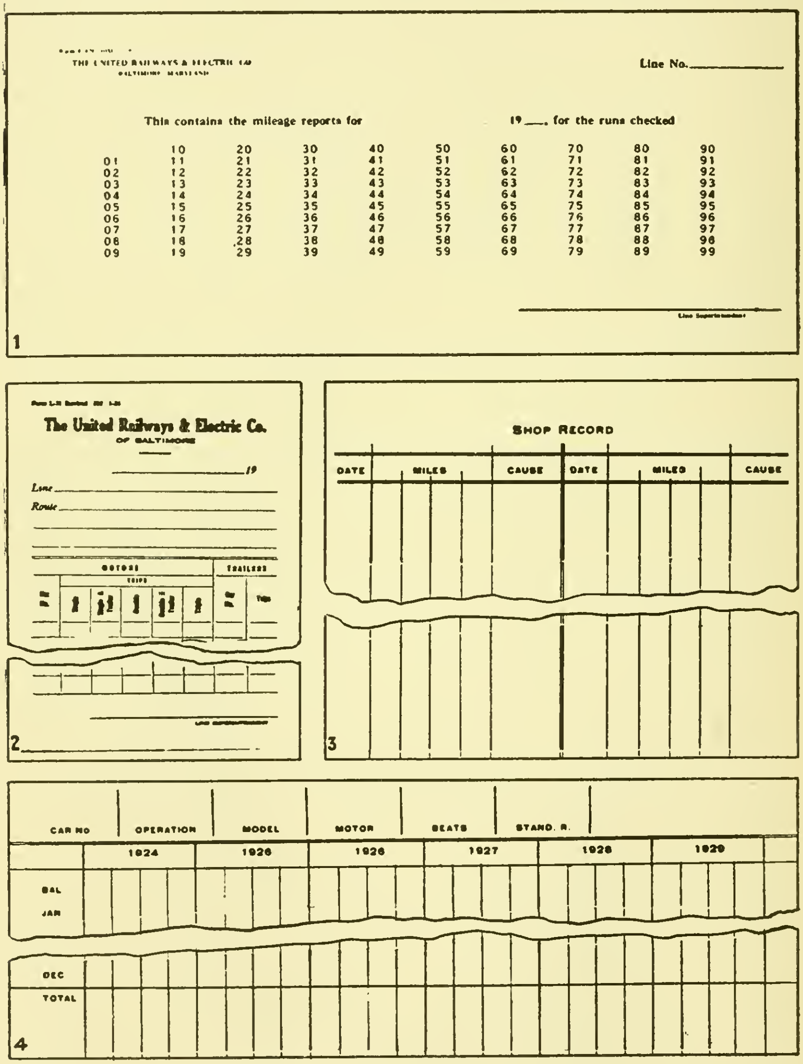
A single observer is placed on each car of a given line, in a position from which he can command a view of the interior of the car. He counts the number of passengers actually on board the car at definite intervals of distance, such as a mile, half-mile or quarter-mile. The sum of all his observations divided by the number of counts yields the average number of passengers riding upon the car. Dividing this by the seating capacity of the car gives the load factor, and dividing it by the number of revenue passengers per car-mile gives the average length of ride on the line investigated. Thus, but one observer is needed per car studied, and there are no computations other than the addition of the counts and the division of the total by the number of counts made.

"Mileage Bureau" Furnishes Data

Since Jan. 1, 1924, the "United Railways" in Baltimore has had in operation a new and efficient plan for collecting and compiling mileage data of car operation. The fundamental data originating in the line superintendent's offices, in the shops and in the schedule department are sent to a "mileage bureau" for compilation. Here tabulating machine cards are prepared from the data and are used in obtaining such totals as are desired.

Before the procedure in the mileage bureau is described it will be of interest to outline what it is expected to do.

The company operates 1500 cars over thirty-five lines. On each line there are several runs, a run being a trip over a designated route. The total of runs is about 200. The total mileage for each of these runs must be determined daily and checked against schedule requirements. There must also be monthly and annual summaries of the mileage by runs, by lines and for the system as a whole. Data are needed also of the seat mileage and the standing capacity mileage. Then the mechanical department requires the mileage for each



THE UNITED RAILWAYS & ELECTRIC CO.
BALTIMORE MARYLAND

Line No.________

This contains the mileage reports for 19___ for the runs checked

	10	20	30	40	50	60	70	80	90
01	11	21	31	41	51	61	71	81	91
02	12	22	32	42	52	62	72	82	92
03	13	23	33	43	53	63	73	83	93
04	14	24	34	44	54	64	74	84	94
05	15	25	35	45	55	65	75	85	95
06	16	26	36	46	56	66	76	86	96
07	17	27	37	47	57	67	77	87	97
08	18	28	38	48	58	68	78	88	98
09	19	29	39	49	59	69	79	89	99

Line Superintendent

1

The United Railways & Electric Co.
OF BALTIMORE

______19

Line ______

Route ______

MOTORS — TRIPS | TRAILERS

2

SHOP RECORD

DATE	MILES	CAUSE	DATE	MILES	CAUSE

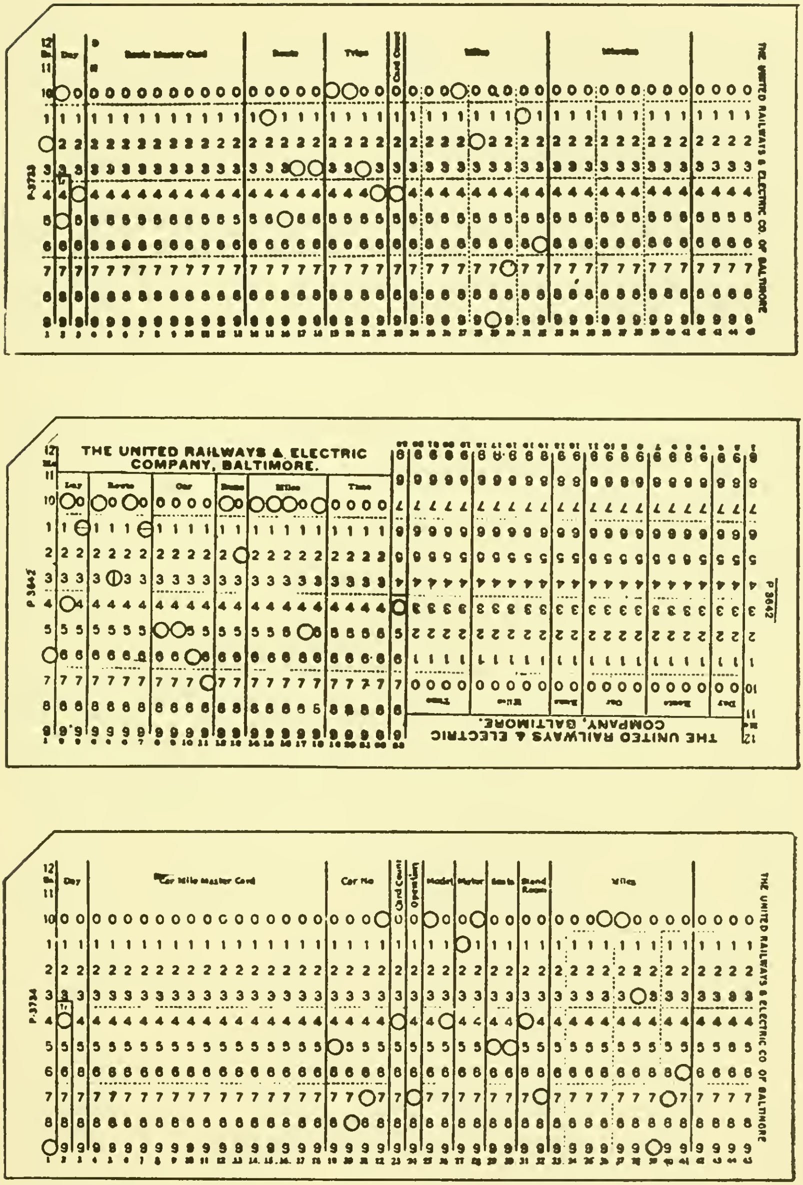
3

CAR NO	OPERATION	MODEL	MOTOR	SEATS	STAND. R.

	1924	1925	1926	1927	1928	1929
BAL						
JAN						
DEC						
TOTAL						

4

Mileage bureau supplies — (1) *envelope for reports;* (2) *line superintendents' report form;* (3), (4) *back and face of* 5 x 8-*inch permanent index card.*



Tabulating-machine cards — (top) *run master card;* (center) *card for individual car-runs;* (bottom) *card for monthly records of individual cars.*

car from month to month and the mileage between important maintenance repairs, such as motor replacements, wheel turnings and car paintings. The total mileages made by each type of car, by each type of motor and by each group of cars having common characteristics are desired by this department.

The "United Railways" uses several types of operating equipment; for example, individual motor cars and trains comprising respectively a motor car and a trailer, two motor cars, two motor cars and a trailer, and three motor cars. Individual records of mileage are needed in each of these classes and also the total mileage made by each car in each of these classes.

All of this information is readily available through the functioning of the mileage bureau.

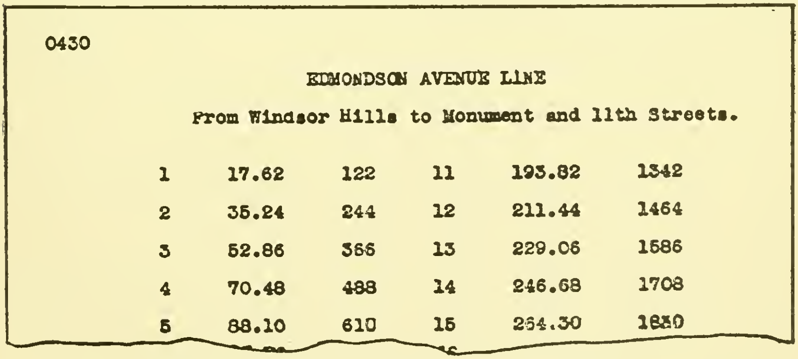
The Line Superintendent's Part

The basic data for the mileage compilations are furnished by the line superintendents on the 4 by 9½-inch form reproduced on page 142. On this a regular run is shown by a "code" number of four figures, the first two designating the line, and the last two the run. On the form special routes have to be itemized. In the appropriate column the number of trips made by each motor car and trailer during 24 hours is entered. The superintendent also enters the total number of trips.

For reference in compiling the report the superintendent has at hand the schedules furnished by the traffic department covering the service as varied from day to day during the week, and also single-sheet instructions showing unusual variations for particular days on each line affected. Having filled out the slips, one for each run, he encloses these in an envelope printed on the face as shown on page 142. On this he enters the date, the line number and the schedule number, and makes checks opposite the numbers corresponding to the last two figures of the run "code" numbers of the enclosed slips. He also encloses the sheet of special operating instructions. The envelopes are forwarded daily to the mileage bureau.

What the Mileage Bureau Does

The mileage bureau first verifies the slips for coding and totaling of trips made, and compares them with the schedule requirements for the day to determine whether the report of extra and short runs is accurate. Run "master cards" (see page 143) are then punched and verified and "listed" with the totals for each line.* From this information line "master cards," of the same form as the preceding, are punched and the listing by



0430

EDMONDSON AVENUE LINE

From Windsor Hills to Monument and 11th Streets.

1	17.62	122	11	193.82	1342
2	35.24	244	12	211.44	1464
3	52.86	366	13	229.06	1586
4	70.48	488	14	246.68	1708
5	88.10	610	15	264.30	1830

Mileage and time chart for use of computer lines, with a grand total for the system, is added to the previous listing. The completed listing, together with the totals reported for extra and short runs, is then forwarded to the traffic department for its records.†

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* The term "listing" refers to the running of cards through the printing tabulator in order that the verifiers may have an opportunity to check the printed tabulation against the original documents. This is considered by the railway company to be a more economical method of verifying than attempting to check back the punched cards.

While these totals required for immediate use have been in preparation, a card was being punched for each car operated on each run, on a form prepared as shown on page 143. This card is double so that it can be used twice. It contains a column for type of operation. It also has a column for time, but in practice this is not used, as the entry of time on the run master card is sufficient. In determining mileages (and minutes if needed) the punch operator uses a series of tables like that shown on page 145, covering all kinds and numbers of trips which a car would probably make in 24 hours. These cards are then listed and verified, the totals being compared with those already obtained for individual runs and lines.

Every ten days the car cards are sorted by types of operation and by cars, and once a month they are listed and totaled by individual car numbers. Thus the mileage of each car is known for each class of service in which it was operated.

The monthly totals for each car are posted on permanent 5 by 8-inch index cards, as shown on page 142, ruled to contain six years' records. For convenience in reference single-car operation is recorded on white cards and other types of operation on colored cards.

The requirements of shopping mileage records are not met by the monthly totals, but the system provides for these as follows: The shop reports to the mileage bureau, daily by numbers, all cars that enter. The mileage record for each car thus reported is totaled up to the day it enters the shop and a record is made on the back of the permanent index card mentioned above, on which is the form shown on page 142. This card thus contains a cumulative mileage record, and a condensed shopping record for the car. By subtracting successive entries the mileage between shoppings is obtained.

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† On the route master card, and the car-mile master card referred to later, the company is not at present using the wide column, the third from the left.

General Service Records

At the end of the month a set of master cards (see page 143) are punched, showing for each car its number, the type of operation, the car model, the motor type, the seating capacity and the standing-room capacity. These master cards are then sorted mechanically under each of the above classifications, listed and totaled, giving the total mileage made during the month in each class of service by each type of car and each type of motor. The total mileage made by a group of cars having a common seating capacity or standing-room capacity is then multiplied by that capacity, the sum totals of these products being respectively the total seat-miles and standing-room-miles. This is the real measure of the quantity of service.

Mileage Involved in Special-Car Movements

Chartered cars and cars making special or occasional trips over routes impracticable to code presented a real problem to the mileage bureau. The report from the line superintendent gives the number of the car and the streets over which it operates, but the difficulty was to determine the corresponding mileage in a reasonable time. The problem was solved by the devising of a map of the system (not to scale) on which stretches of track are represented by colored lines. The colors are used arbitrarily with no purpose other than to permit a route to be readily traced, hence lines of the same color are not allowed to intersect. One end of each color stretch is marked zero, and at all intersections, terminal points, crossovers, etc., the mileage from this zero is indicated in the same color.

In using the map to determine the mileage of a given trip the computer sets down in parallel columns the notation at each point of entry and leaving of a color stretch by a car. The higher numbers go in one column, the lower in the other. Then the difference in the totals of these columns is the mileage covered.

What the Plan Accomplishes

By way of review it may be stated that before the close of a day's business the mileage bureau has furnished the traffic department the following information covering the previous day: (1) for each run, each line, and the entire system, (a) total number of trips, (b) mileage, (c) car-hours. (2) For the system, (a) mail-car mileage, (b) chartered-car mileage, (c) work-car mileage, (d) supply-car mileage, (e) variations from standard schedules, with the number of extra and short trips, and the extra and short mileage.

The work which has been described is done with mechanical accounting machines of the Powers type. With these machines duplication in records kept by the various departments can be eliminated. They will yield a saving in clerical expense and the company will be able somewhat more accurately to check up the maintenance of equipment, etc.

Power Saving Through Careful Instruction

An administrative problem of no mean importance is to secure economical operation of cars with regard to power consumption.

The possibilities in this direction through stimulating interest in intelligent handling of controllers and brakes are illustrated in last year's experience of the "Charleston Consolidated." As a preliminary to the possible later purchase of one of the standard forms of power saving devices, an inspector was appointed to instruct trainmen in the proper use of power, the handling of air brakes and the making of emergency repairs. The inspector was given the title of "chief operator." During April, 1924, the first month in which he was able to devote most of his time to this work, he succeeded in reducing the energy consumption per car-mile by 17.6 per cent, or 0.409 kilowatt-hour per car-mile, as compared with April, 1923. The value of this saving was $535.

Heater Control Under One Man

To minimize unnecessary use of car heating current, a new system of heater control has been adopted by the Northern Texas Traction Company, by which the heating is all under the control of one man, the chief inspector. At six convenient points in Fort Worth, red lamps, known as "heater lights," are so placed that at least one of them is passed by a car on any division. The lighting of these lamps is the signal to trainmen to turn on their electric heaters. When the lamps are not lighted heaters are to be off, and it is the division inspector's duty to see that they are turned off. The turning on and off of the heater lights is done by the chief inspector or some one working under his direction. The trainmen report daily on their trip sheets the number of hours that all or one-half of the heaters were in use.

Along the same line, the San Francisco-Sacramento Railroad has recently installed thermostatic control of the heaters on its cars with a view to energy saving.

Desiring the co-operation of its employees in keeping down the consumption of electrical energy for purposes other than car operation, the Northern Texas Traction Company has adopted the practice of posting in graphical form the energy used week by week. Charts mounted conspicuously in the various buildings show by a black line the previous year's consumption for power and lighting, and by a red line the consumption for the current year. Employees have responded by cutting out waste.

Helps to More Reliable Operation

There are numerous helpful "kinks" and devices which aid in operation, of which a number were mentioned in the 1924 presentations. For example, all freight crews on the San Francisco-Sacramento Railroad have been provided with electric lanterns. These are superior to oil lanterns in that they cannot be extinguished in wind and storm, and they eliminate all fire and accident hazard, which is especially important when gasoline and other inflammable materials are being handled.

An automatic train reporting device has been developed by the San Francisco-Sacramento Railroad to notify the train dispatcher when trains pass certain points on the line. The operators at the substations in a 47-mile section of the road, where there are no towns or stations, formerly reported to the dispatcher when trains passed their substations. This was done to enable the dispatcher to keep trains on time and to change meeting points of trains when necessary. This practice had to be discontinued, and as a result the company devised the present scheme. It involves a track box placed beneath the running rail, which actuates a relay when a train passes over it. The relay, in turn, rings a bell in the dispatcher's office in a signal code which tells him which substation is being passed. If trains happen to pass two stations at the same time, the signals are received in sequence.*

The engineers of this company have also worked out a plan by which signal lamps are lighted only one block ahead of a train. The lamps in the shelters are connected with the signals in such a way as to have them lighted in the same way. These shelter lights come on when the train approaches within three miles and they go off when it is the same distance away after leaving.

Large Equipment of Fire-Hose Bridges

For use in promptly restoring service, after fire alarms have been turned in, the "United Railways" has installed thirty sets of hose bridges. Each trouble truck is equipped to carry two sets, and there is also a trailer which carries five sets.

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* This work is done over the dispatcher's line by a simplex circuit, and code messages are received in the dispatcher's office without being heard on the telephone line.

All city alarms of fire are received on a gong at the main trouble station, and when one comes in, the crew at the nearest trouble station is immediately given the call. The men unhook the bridges from brackets on the wall where they are stored, place them on their truck and respond to the call. If there is more than one alarm, or if the first crew calls for assistance, a second truck is sent out with the trailer.

As soon as the fire apparatus is in place, the men immediately proceed, after obtaining permission from the fire chief, to assemble the hose bridges in proper position and place the jumpers. From five to eight minutes is required to take the bridges off the truck and place them in service. They are, of course, taken from the truck and assembled ready for the truck while the fire apparatus is being placed in position.

Sleeping Cars Attached to Local Trains

The plan for operation of its new sleeping cars by the Interstate Public Service Company is an economical one. The schedule for the late night local cars out of Louisville and Indianapolis has been changed so sleepers can be attached to them, leaving each end of the line at 11:30 p. m. The north-bound local sets the sleeper at Greenwood where it is picked up early the next morning by a regular local, arriving in Indianapolis at about 7 a. m. The southbound local takes the Indianapolis sleeper to Scottsburg, where it is picked up similarly. The sleeper haul of 117 miles is accomplished by an addition of approximately 40 miles for the night local.

The use of fares other than five cents has brought about the use of tokens. It is necessary in some way to encourage the use of these in order that their full benefits may be had.

Aids in Fare Collecting and Reporting

Although tokens had been sold by the Northern Texas Traction Company since the establishment of an odd fare (7 cents) in Fort Worth, they were little used by patrons and little effort was made to push their sale. Early in 1924 an increase in schedule speed was decided upon, which gave the company a real incentive to extend the use of the tokens and thereby decrease the time needed for change making. The installation by the city of traffic signals in the business district made it further desirable that car loading be prompt so that an operator could take prompt advantage of a signal to go. Incidentally it was believed also that the use of the tokens would stimulate riding.

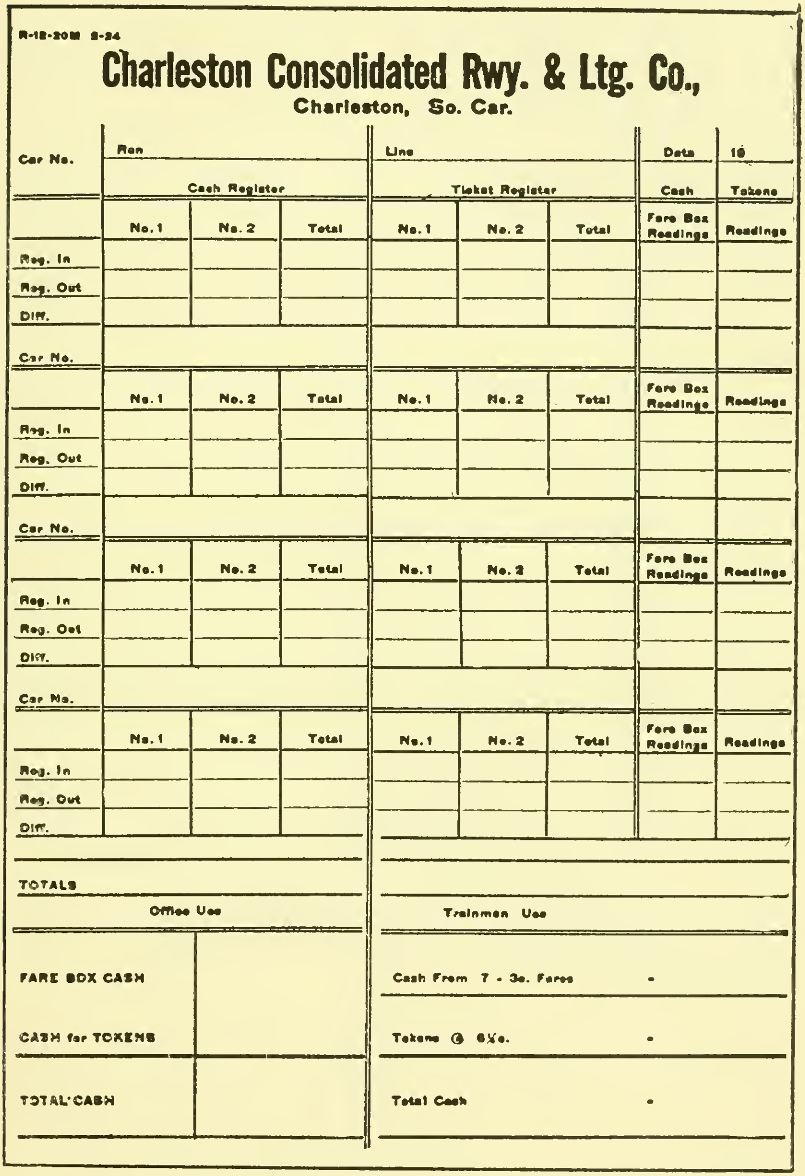
Investigation showed that the chief objection to the tokens was fear that they would be lost amongst pocket change. Rings on which the tokens could be conveniently carried were therefore distributed. These are 1¼ inches in diameter, of steel, and in two parts hinged together and provided with a catch that insures a smooth joint with the ring closed. On May 31, 1924, all "daylight men" on city cars handed their passengers these rings enclosed in envelopes on which was a statement signed "The Operator," explaining why the rings were distributed and that he had an ample supply of tokens for sale. On the back was a company statement of the advantages of using tokens. In a few hours 35,000 of the 40,000 rings purchased by the company had been distributed. Their effect, combined with that of accompanying publicity, was to increase the number of tokens going through the fare boxes from 1,300 or 1,400 per day to more than 7,000.

Lightness of Tokens Appreciated

The Union Street Railway has utilized the recent improvements in metal tokens to popularize their use in several ways. The company has for some years sold twenty-one metal tickets for a dollar, but the tickets were clumsy and the patrons did not like them. When the newer form of light token was adopted last year, the situation was improved. The change was advertised on the front pages of the newspapers, and occasion was taken to emphasize the cheapness of the car rides. Thrift placards were placed in frames inside the cars, referring to the desirability of using the automobile for pleasure and the street cars for business. Pocket books and containers for the tokens were distributed. The tokens were placed on sale at several drug stores for the convenience of patrons.

To save time in making change on its cars, the "United Railways" has stationed uniformed men at resorts, ball grounds, theatres, depots and busy loading points to offer car checks to patrons before they board the cars. This is to supplement the sale of checks by conductors, at all carhouses, at the company's central office and at many banks, business houses and stores.

Turning from the use of tokens to the allied topic of conductors' reports, the most interesting item in this year's presentation comes from the Charleston Con-



R-12-20M 2-24

Charleston Consolidated Rwy. & Ltg. Co.,

Charleston, So. Car.

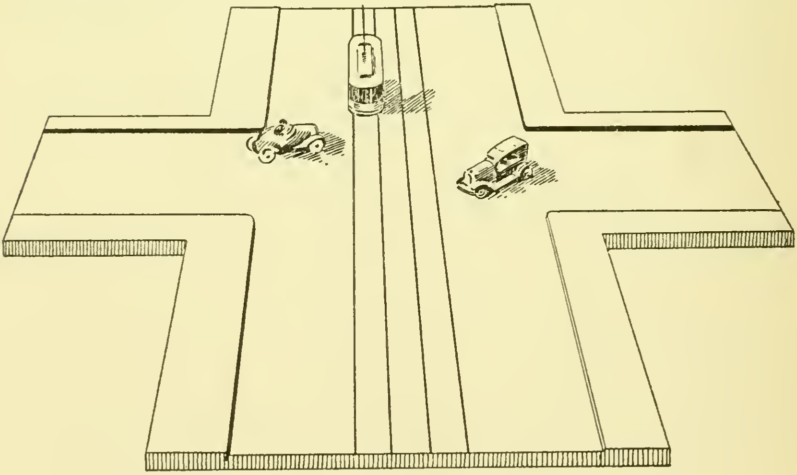
Car No.	Run			Line			Date	19
	Cash Register			Ticket Register			Cash	Tokens
	No. 1	No. 2	Total	No. 1	No. 2	Total	Fare Box Readings	Readings
Reg. In								
Reg. Out								
Diff.								
Car No.								
	No. 1	No. 2	Total	No. 1	No. 2	Total	Fare Box Readings	Readings
Reg. In								
Reg. Out								
Diff.								
Car No.								
	No. 1	No. 2	Total	No. 1	No. 2	Total	Fare Box Readings	Readings
Reg. In								
Reg. Out								
Diff.								
Car No.								
	No. 1	No. 2	Total	No. 1	No. 2	Total	Fare Box Readings	Readings
Reg. In								
Reg. Out								
Diff.								
TOTALS								

Office Use		Trainmen Use
FARE BOX CASH		Cash From 7 - 3c. Fares .
CASH for TOKENS		Tokens @ 6¼c. .
TOTAL CASH		Total Cash .

Face of combination trip sheet and ticket envelope. Back contains summary forms solidated Railway & Lighting Company. This company has used with considerable satisfaction a combination trip sheet and ticket envelope adapted from a form used by the Tacoma Railway & Power Company. The elimination of the separate trip sheets saves $60 per year and reduces wastage, as the sheets formerly used were very convenient as scratch paper. The printing on front of the envelope is as reproduced on a reduced scale on page 155.

Facilitating the Settling of Claims

An ingenious plan has been devised by the Northern Texas Traction Company to show to juries just how an accident occurred. The experience of the company is that jurors are anxious to know the details of an accident but have difficulty in picturing them from verbal descriptions. The company, therefore, built to scale a street intersection in portable form, convenient for taking



This model is useful in analyzing and explaining accidents into court. One of the streets in the model has double tracks, and the dummy gage between tracks is the same as that of the tracks, so that the inside rails form one track to represent conditions on a single-track street. Street cars and automobiles used with this model were purchased in toy stores and are not exactly to scale. While this model contains only tangent track it has served its purpose, for drawings can be used to supplement it, if curved track is involved in an accident.

The model is kept in the claim agent's office and is found useful by him in discussing with claimants how an accident happened. It has helped him often in making satisfactory adjustments of claims.

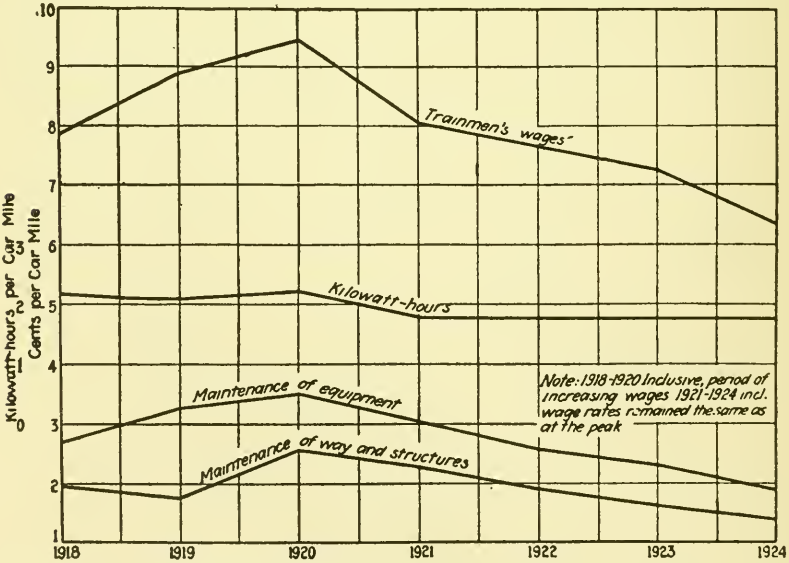
In connection with claim adjustment, an administrative detail which has proved effective in Charleston was the moving of the office of the claims adjuster from the main office of the "Consolidated" down town to the railway office 2½ miles away. This has eliminated the cost of copying and recopying accident reports and it has made possible the division of one clerk's time between the claims and railway departments. It has also placed the adjuster nearer the scene of most accidents.

Substantial Reductions in Costs

The effect of operating and other economies is reflected ultimately in the cost data. This is well illustrated in the case of the Northern Texas Traction Company. In the matter of trainman's wages the cost on this property has been reduced from 9.4 cents per car-mile in 1920 to 6.35 cents in 1924. The hourly rate, however, has not been decreased since the peak of 1920.

The energy consumption per car-mile was reduced from 2.2 kilowatt-hours per car-mile before 1920 to 1.75 after that year and it has since been held at the lower figure. The result was produced by using rolling-stock of lighter weight and utilizing to the full the stimulating effects of coasting clocks. Similarly the cost of equipment maintenance was reduced from 3.5 cents to 1.9 cents per car-mile. The light rolling-stock was one element in this reduction, others being new and up-to-date shops, and educational work carried on among the shop men. The maintenance cost on way and structures has come down from the 1920 peak of 2.55 cents per car-mile to 1.4 cents, through the use of the lighter cars, the extensive use of track welding equipment and the introduction of modern track tools.

As the culmination of a 5-year program of cost reduc-



Cost reductions give tangible evidence of operating economies on the Northern Texas Traction property tion the United Railways & Electric Company is now saving over a million dollars a year in all departments. This is made up of scores of individual items, few of them large. The greatest single saving was in wages due to the large use of 1-man cars and trailer cars. Another was in the improved accident record, while still another was in the contract under which the power supply is purchased.

The effect of the use of modern equipment, particularly rolling-stock and power, is strikingly shown in the experience of the Aurora, Elgin & Fox River Electric Company. Comparing the first half of 1923 and 1924 the car-miles furnished were 330,000 greater during the latter period, but the cost of energy was $33,500 less. The average unit cost of the energy was also less by almost 0.4 cent per kilowatt-hour. The cost of car operation decreased 4.48 cents per car-mile and the energy consumption 1.78 kilowatt-hours per car-mile. The over-all result was that gross operating revenue increased 4.19 per cent, while gross operating expense decreased 10.92 per cent.

Law to Prevent Transfer Abuse

In concluding this chapter on operating economies it is appropriate to refer to the success of the United Railways & Electric Company in securing, during 1924, the passage by the Maryland Legislature of a bill to penalize persons abusing the transfer privilege. The company has long been active in efforts along this line, and feels that the evil will now be minimized. The law provides as follows:

> "No transfer ticket or written or printed instrument giving or purporting to give the right of transfer to any person from a conveyance operated upon one line or route of any carrier of passengers to a conveyance operated upon another

line or route of any other carrier of passengers shall be issued, sold or given except to a person lawfully entitled thereto. Any person who shall issue, sell, or give such a transfer, ticket or instrument aforesaid, to a person not lawfully entitled thereto, and any person who shall receive, with intent to use for passage, or shall use or offer for passage any such transfer ticket or instrument, or shall sell or give away such transfer ticket or instrument to another with intent to have such transfer ticket used or offered for passage, shall be guilty of a misdemeanor, and, on conviction, thereof, shall be punished by a fine not less than $10.00 or more than $100.00 for the first offense, and for each subsequent offense by a fine of not less than $100.00, or by imprisonment for a term not exceeding six months, or both, in the discretion of the court."

This company also found that certain of its conductors were flattening dimes until they were of the diameter of a cent, giving these to passengers to deposit in part payment of two fares. Evidence of this was turned over to agents of the federal government, as it is a crime to mutilate coins. One offender was sent for six months to the government penitentiary at Atlanta.

CHAPTER IX

Financial Structure of Electric Railways

THE standing of a utility in its community is indicated by the latter's attitude towards its securities. During the past two years the Interstate Public Service Company has required unusual amounts of capital for improvements and new equipment. This has been secured through the sale of preferred stock. General improvements are financed through 7-per cent prior lien preferred stock sold to the general public through the employees or the company offices. This is sold at par and has a ready market.

For new equipment purchases preferred stock is sold through a subsidiary, the Interstate Car Trust Equipment Company. The securities are usually on a 6-per cent basis, to net the railway about 95 per cent. They sell readily.

Two years ago, it was necessary to issue 6-per cent gold refunding bonds to the extent of $973,000, against the Northern Division of the railway between Indianapolis and Columbus, Ind. These were sold privately by a local banking concern, without public offering. Their standing is indicated by the purchase of $200,000 worth for its endowment fund by one of Indiana's oldest colleges.

An Eastern life insurance company took a similar amount.

As was mentioned in last year's report, early in 1923 the Northern Texas Traction Company sold $500,000 in 5-year, 7-per cent coupon notes to its employees and the public. The money in part financed the construction program of 1923–'24, the balance having been provided out of earnings. The economies resulting from the improvements made this possible. Although no new securities were sold during the year covered by the 1924 presentation, the company is in a position to finance future needs on most favorable terms.

How the Baltimore Property Gets New Money

Equally interesting with the notable physical and operating improvements made recently by United Railways & Electric Company is the ingenious financing plan put into effect in 1924. The company has been limited for years in its ability to secure capital, because its mortgages were all of the " closed " type. The need was met for a time by the following expedients:

1. There were in the treasury some first consolidated mortgage 4-per cent bonds, held for redemption of underlying bonds. These were selling far below par on the market. Six-per cent coupons were substituted for the 4-per cent coupons and the bonds were issued as " first consolidated mortgage 6s." A number of holders of the " 4s " expressed a desire to exchange their " 4s " for " 6s " on some fair basis. Accordingly, with the approval of the Public Service Commission, holders of " 4s " to the par value of $2,684,000 were given " 6s " for " 4s " on payment of $250 per $1,000 bond. Thus

the company received $671,000 without adding to its capitalization, although this money draws 8 per cent interest.

2. Back in 1906, foreseeing the difficulty which would be experienced by the railway in new financing, its fiscal agents, Alexander Brown & Sons, of Baltimore, organized the Maryland Electric Railways Company to construct and acquire certain necessary facilities which the "United Railways" could not finance. Its mortgage, however, was for only $8,000,000 and "closed." It operated successfully up to 1924, but then it and two other "United Railways" subsidiaries (railways with "closed" mortgages) were, like the parent company, in a position where they could get no further funds.

Out of this difficult situation the following plan was evolved:

The three subsidiaries were consolidated as The Maryland Electric Railways Company, with a mortgage or deed of trust executed, under which bonds can be issued. All stock of the consolidated company is owned by the "United Railways." The indenture authorizes an issue of $25,000,000 in bonds, to be issued in series at such rate of interest and length of maturity as may be decided by the board of directors. There is no ultimate due date of the mortgage itself. Each series may be self-perpetuating, provided that the entire issue does not exceed $25,000,000.

These bonds may be drawn down from time to time in series, but if in future The Maryland Electric Railways and the "United Railways" should become consolidated and if, under the laws of Maryland, it is provided to issue "open-ended" mortgages, then this mortgage may become, upon the filing of a supplementary indenture, an "open-ended" mortgage.

This mortgage, with the bonds issued under it, was made as strong as possible. It is a first lien on valuable property and a second lien on other property on which it will eventually become a first lien by the redemption, as they become due, of underlying liens. All of the stock of the new company was deposited with the trustees as collateral for the first mortgage bonds.

Under the original Maryland Electric Railways Company agreement, the "United Railways" paid a sinking fund as rental for the purpose of taking up the bonds of the Maryland Electric Railways Company. The sum of $1,357,512 had been so paid and used to redeem bonds of the old Maryland company to the extent of $1,441,000 principal amount, leaving a balance outstanding of $3,505,000, principal amount, due in 1931. ($4,946,000 was outstanding at the beginning of 1924.)

The trustees of the United Railways & Electric Company's mortgage felt that they had a money interest in the "Maryland Company's" properties to the extent of the payments made under this sinking fund, on account of what they might consider the purchase price of these properties. In order to meet that rather difficult situation, it was agreed that the Maryland Electric Railways Company should refund to the United Railways & Electric Company this sum of money; new bonds were put out in place of the old bonds held in the sinking fund; the money was paid back to the trustees and held under the mortgage, and this money can be withdrawn upon orders of the Circuit Court of Baltimore City and applied for by the "United Railways" for capital expenditures, upon approval of the Public Service Commission.

Under this financial plan, early this year a syndicate headed by the firms of Alexander Brown & Sons and E. H. Rollins & Sons offered $4,000,000 of the Maryland Electric Railways Company "first and refunding mortgage gold bonds, Series A 6½-per cent," at 100 and interest to yield 6½ per cent. These bonds mature in thirty-three years. The issue was greatly oversubscribed, and the sale of an issue of this amount of bonds on a property purely traction bespeaks confidence of the public and a return of a better feeling of the investing public towards traction securities.

The proceeds of the sale of these bonds are to be used to pay for a portion of the property of the Maryland Electric Railways Company; to reimburse the United Railways & Electric Company for additions, and on account of purchase price of, and for capital improvements upon part of the property, and for other corporate purposes.

At the same time provision was made for issuing $3,800,000 "first refunding mortgage bonds Series B," and to set aside such amount thereof as may be required to exchange for, or to be used to redeem the $3,505,000 outstanding of the Maryland Electric Railway Company first mortgage 5-per cent bonds, which mature Oct. 1, 1931, and $2,000,000 first refunding mortgage bonds to be reserved to redeem $2,000,000 Baltimore, Sparrows Point & Chesapeake Railway Company's first mortgage 4½-per cent bonds, maturing Feb. 1, 1953, the only other funded debt of the consolidated Maryland Electric Railways Company.

It will be readily seen that this plan greatly strengthens the whole financial structure of the street railway system in Baltimore.

The "United Railways" bondholders secure $1,357,512 which must be spent on capital improvements on the property of the United Railways & Electric Company; and in the second place, they obtain a vehicle of financing which enables the "United Railways" to go ahead and not stop; in the third place, they cannot lose anything by this transaction, because immediately they secure a new lease on the properties now comprising the Maryland Electric Railways Company, which is equivalent to the former lease, and in addition, they obtain all the stock of the "Maryland Company" and the "Sparrows Point Company," represented by the consolidated company, pledged under their mortgage, and under this plan the subsidiary companies, by stock ownership, actually are owned by the "United Railways."

APPENDIX

Report of the Charles A. Coffin Prize Committee of the American Electric Railway Association — 1924

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Report of the Charles A. Coffin Prize Committee of the American Electric Railway Association — 1924

WITH the presentations made by certain electric railway companies for the second annual prize, the committee is becoming increasingly impressed with the great stimulus given to modernization and general improvement in the industry by the Charles A. Coffin Foundation, established by the General Electric Company. The material which came to light through the contest last year and the example afforded other electric railway companies by a wide reading and study of the accomplishments and methods of the winner have exerted an influence for betterment the results of which are already discernible in the work of a number of companies during the past year. Thus, the Charles A. Coffin Foundation is affording a very helpful impetus to the general program of modernization that is steadily gaining headway. The new presentations this year will help further to build this new spirit of aggressive development in the industry and carry it on with accumulative effect.

It will be recalled that under the conditions of the Foundation it is provided that an annual award of the Charles A. Coffin gold medal will be made to that electric railway company in the United States which during the year has made the greatest contribution toward increasing the advantages of electric transportation for the convenience and well-being of the public and for the benefit of the industry. It is also specified that the company receiving the medal shall receive $1,000 for its employees' benefit or similar fund. Every electric railway company in the United States was invited again this year to participate in the contest and urged to send to the committee a statement of its activities and accomplishments as comprised within the field of the award.

For the contest this year the committee agreed upon and published eight points which would be considered the principal factors in making the award. It used the same relative ratings for each of these points in summing up the claims of the various companies as were used last year. (See Foreword, page II.)

This year presentations were filed by nine companies. The committee made a detailed study of the contents of each report and carefully weighed the merits of each claim. All of the presentations contained evidence of much worth-while accomplishment. All of the contestants are to be congratulated, not only on the fine work they are doing for their own betterment, but for the elaborate pains taken to put their accomplishments before the committee. In compiling and writing their reports they have taken stock of themselves and they have made available to the field their experience. Both results are a justification for the labor and expense involved, entirely aside from the prospect of winning the award

Their statements range from a brief listing of achievements to a most comprehensive and detailed explanation and proof of the claims made. The choice of the winner this year was by no means a simple matter to decide. But after extended deliberation and study, the committee finally came to unanimous agreement as to that company which measured up highest in its accomplishments during the year.

As already indicated, the committee found much to commend in the progressive improvement work done as noted in the briefs of each of the companies. In the report of the Aurora, Elgin & Fox River Electric Company, Aurora, Ill., the committee was particularly impressed with the physical improvements, bettering of service and the general policies followed which have resulted in an increase of 1,000,000 passengers in a year and made 65 per cent of the employees stockholders in a period of seven months.

The particular accomplishment of the Charleston Consolidated Railway & Lighting Company, Charleston, S. C., in which the committee had special interest was the transformation of a $20,000 deficit into a $23,000 net. This is all the more notable in view of the fact that it was done in spite of a diminishing population and an increasing number of automobiles.

The work done by the Interstate Public Service Company, Indianapolis, Ind., in taking three companies, two of them run down and not paying, and developing them into a fine, profitable railroad is so outstanding in all its phases that the committee points with pride and high commendation to the whole achievement. The committee was especially impressed with the extensive work done in helping the farmers, both as to the best crops to grow on their particular soils and as to right time of marketing. This has not only developed good will and passenger business, but has brought the railway a very handsome growth in its freight haulage.

The Memphis Street Railway, Memphis, Tenn., has met with particular success in reducing its expenditures for accidents by splitting fifty-fifty with the men any savings under the amount established as the average over a certain previous period.

The San Francisco-Sacramento Railroad, Oakland, Cal., has a record which stands out for the remarkable freedom from accidents. Since the road was put in operation Sept. 3, 1913, the company has never killed or injured a passenger. This company has also been a strong influence behind the formation of a drainage and irrigation district that will improve a 200,000-acre section of land and bring in settlers, which in the end will work to the advantage of the railroad. While protected from unwarranted motor bus competition by the state commission, this company has not turned a deaf ear to the merits of bus transportation. It has put in through rates and joint schedules with authorized existing motor carriers connecting with the railway where these carriers have obtained permits from the railroad commission to operate in territory beyond the company's lines.

The Shreveport Railways, Shreveport, La., has accomplished a reduction in its accident expenditures from 5 per cent of the gross to 2 per cent. It stands out also for its insistence upon clean, well-painted, well-lighted cars, operated on regular schedules over well-maintained tracks; and for its efforts to keep trainmen constantly drilled in the art of smooth operation and courteous treatment of passengers.

The Union Street Railway, New Bedford, Mass., has found merited reward in executing the policies expressed in its motto, "Safety and Service, Courtesy and Cleanliness." It has also made the most of economies where these could be practiced without affecting the quality of service.

The United Railways & Electric Company, Baltimore, Md., has presented to the committee a notable record of improvement. It is also evident that here is a property which is operated with exceptionally high efficiency. The committee was particularly impressed with the planning and careful execution of a five-year modernization program which culminated this year to produce an annual saving of $1,000,000 in the company's operating expense.

From this point on the committee will discuss the presentation of the railway company which is to be awarded the prize this year. The committee was particularly impressed with the fact that the company through its service and in every other way cultivated the good opinion of the public which it served.

A feature of the company's activity which deserves special mention here is its short-haul real estate development. By a careful survey of the city the company found that there were more than 24,000 vacant residential building lots within four blocks of existing street railway lines. This information was brought before the public in an intelligent advertising campaign, and it has served simultaneously two important purposes. It has tended to check the agitation for long extensions of car lines out to new real estate developments in outlying sections and it has served to develop short-haul riding. It simply brought before the public incontrovertible facts showing that the railway had anticipated the needs of the public long in advance and that with the abundance of building lots adjacent to street railway lines it was an imposition to ask the company to build extensions when the present lines will serve a city of 100,000 more people than it now has.

The winner stands out for its happy faculty of keeping the public interested in its activities. Two cars painted pure white, with various safety and merchandising slogans on the outside, manned with operators dressed in dress uniforms and run on various lines, is one example of the means adopted to arouse interest in street railway service. Incidentally, the use of these white "talking" cars was considered of enough interest to be syndicated by the Newspaper Enterprise Association and the story forwarded to 135 newspapers in various parts of the United States.

Newspaper advertising, good slogans inducing the automobile driver to ride the street car, dash signs for company advertising and slogans, and similarly the use of interior car cards, all have been effectively employed in impressing upon the local people the fact that the street railway management is aggressively seeking to give good service, please its patrons and attract more business to its lines. By these methods everyone in the city has come to believe the company alive and progressive. The company has by constant but comparatively inexpensive advertising inoffensively hammered home to the automobilist the slogan of "Ride the street cars and save the difference," to the extent that it has created much favorable publicity and comment, which in turn has helped to popularize the electric railway service.

A most notable achievement is summed up in the company's claim that in spite of increasing costs and private automobile competition its ratio of operating cost to gross revenue has been kept down to the low figure of 61 per cent for the year.

Besides a consistent, pleasing and effective advertising campaign, of which the presentation contains a host of examples, this winning company also makes the contention that its service has been popularized by the use of 1-man single and double-truck cars. The original installation dates back to 1916. The change-over from 2-man operation has been brought about over a period of eight years. The public has been completely sold on the idea because the company shortened the headway and increased the schedule speed on all lines. The change to 1-man operation was accomplished without laying off any men, due to the increased service rendered. All car operators are enthusiastic over the one-man operation and they would not care to revert to 2-man operation.

The use of metal tokens with the odd fare of 7 cents was inaugurated as a means of speeding up. The tokens were sold without reduction in the rates. They were not used extensively because people seemed to be afraid of losing them. The company, through the operators, gave each passenger as he boarded the car one day a simple metal ring on which to carry his tokens. It was handed to him in a small envelope on which were printed the reasons why the use of tokens would benefit passengers. About 35,000 of these rings were given away between 5 a. m. and 2 p. m. of last May 31. The sale of tokens jumped immediately from 1,300 a day to 6,000, and the sale has continued since then at nearly that level. The total cost of this scheme was $600.

Under the heading of economies introduced in operation, the winner shows how the cost of trainmen's wages per car-mile has been steadily decreased since 1920, without any reduction in wages. In 1920 the figure for this item was 9.45 cents per car-mile, while at the end of June, 1924, it was 6.35 cents. This is the result of extending the use of 1-man cars and of faster schedule speeds. Similarly, the energy consumption over the same period has been reduced from 2.2 kw.-hr. per car-mile to 1.75. Use of light-weight rolling stock, building of new and up-to-date shops, installation of modern tools and shop equipment and the educational work carried on with the shop men have been factors in bringing about a steady decline in the cost of maintaining equipment from 3.5 cents per car-mile in 1920 to 1.9 cents per car-mile in 1924. The cost of maintenance of way and structures has come down from 2.5 cents per car-mile in 1920 to 1.4 cents in 1924. Besides the effect of light-weight rolling stock in this figure, the extensive use of track welding equipment and modern track tools have had a bearing on producing the results. These reductions have been achieved in spite of the fact that the wage scale now prevaling on the property is as high as the scale for 1920; that the standard of maintenance is higher than at any time, and that the condition of the property has furthermore been materially improved.

The use of a carefully prepared budget system, which the company designates as "the bogey," has resulted in a coordination and control of expenditures which has helped materially in the general introduction of economies throughout the company. Careful attention to the prevention of fires, equipping all buildings with fire-fighting equipment, organization of fire-fighting brigades, with frequent drills, and general good "housekeeping" have resulted in a decrease in the company's insurance premium of about 20 per cent since 1920. An interdepartment telephone installed in the shop has faciliated the work there by bringing master mechanic and foremen into ready communication.

Construction standards, since the advent of the light-weight car, have been materially altered. It was found that the track could be built of lighter steel and that changes could be made in the ballast and foundation which would make the construction less expensive.

In its accident prevention work, this company is continuing its system, followed for some time back, of analyzing the individual performances of trainmen with regard to accidents. The results have been very satisfactory, as shown by the fact that the number of accidents and amount of money paid out during the past year have continued to show a decrease over previous years in spite of an increase of more than 5,000 automobiles owned in the city and an increase of approximately 100,000 revenue car-miles operated. In addition to monthly meetings of the trainmen by lines, at which the courteous treatment of passengers and accident prevention are discussed, another feature introduced during the past year was joint meetings between claim adjusters, transportation department inspectors and other interested employees. This has resulted in close co-operation between the claims and other departments since there is a better understanding of claims department requirements. The use of signs reading " Look out for the cars " and hung on the overhead at street intersections, the widening of a street by the company when constructing a new car line in order to reduce the accident hazard, and the use of an improved trainmen's accident report form are other details from which the company has derived good results.

With respect to the development of good relations between management and employees, the winning company states that it has never had a serious difference of opinion between the management and employees. The employees have been kept acquainted with full details concerning the company and it has been made plain to them that there are no secrets in the operation of the property. This has resulted in an understanding on the part of the employees of the necessity for inaugurating new economical practices. It has gained for these economies the wholehearted support that was so necessary to make them successful. The employees realize that the company expects every one to do more than his duty and these economies have been obtained without the payment, in any form, of a bonus or commission. The labor turnover is said to be small. Such things as mutual aid for the benefit of those who get sick, educational facilities, clean, sanitary workshops, up-to-date tools and equipment, loan of money when necessary, and last, but not least, a kindly word and the benefit of experience when it is asked for, are among the things that have helped to provide favorable employee relations.

One rather unique feature of the company's relations with its men is that at intervals the manager holds meetings with the city and interurban trainmen and acquaints them with the trend of the company's affairs. These meetings have served to make the trainmen feel that they are a vital part of the organization and as such are entitled to know the trend of affairs. At these meetings the trainmen also get facts and figures which enable them to give the public intelligent answers to any questions that may be asked. On one occasion the trainmen on city lines were asked to give their individual ideas on how to increase the company's business. Prizes were offered for the best letters written on the subject. Ninety-five per cent of the trainmen sent in letters in response to this request. Many good suggestions were set forth. A similar competition for the interurban trainmen brought letters from every one of them, without exception.

This company believes that service means more than just providing transportation. It supplies a service that is called fast. The headways are much less than they should be on most lines. It believes that its patrons should wait as short a time as possible for a street car. Furthermore, the frequent headway practically insures a seat for every passenger. Even during the peak hours it is not unusual to note the absence of standees. In general this company has modernized its property and its service. It has something good to sell and is selling it by modern methods — by advertising and by " delivering the goods."

In this brief way, the committee has endeavored to point out a few of the accomplishments of the winner which were set forth in its claims for supremacy in this year's contest. The committee is pleased to announce now that the Charles A. Coffin gold medal for 1924, an award for outstanding contribution to the art of electric railway transportation, is awarded to the Northern Texas Traction Company, Fort Worth, Tex.

The above report was signed by Britton I. Budd, chairman of the committee, J. N. Shannahan and James H. McGraw.

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